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Safety

**USAF GUIDE TO AVIATION SAFETY
INVESTIGATION**

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This pamphlet explains procedures for investigating and reporting all US Air Force mishaps. It supports Air Force Policy Directive (AFPD) 91-2, *Safety Programs*, and Air Force Instruction (AFI) 91-204, *Safety Investigations and Reports*. It is intended for use by all persons who investigate and report Air Force mishaps, and is particularly tailored to the needs of persons assigned to Interim Safety Boards (ISB) and formal Safety Investigation Boards (SIB) following Class A or B flight mishaps (see AFI 91-204 for definitions). This instruction provides guidance regarding the preparation of privileged safety reports, which must conform to format and distribution criteria contained in AFI 91-204. The reporting requirements in this publication are licensed by report control symbol HAF-SE(AR)9404. Failure by military personnel to observe the distribution prohibitions and other mandatory provisions of AFI 91-204 may be a violation of Article 92, *Uniform Code of Military Justice* (UCMJ). Violations by civilian employees may result in administrative disciplinary action without regard to otherwise applicable criminal or civil sanctions for violations of related laws. Send major command (MAJCOM) supplements to HQ USAF/SE, 9700 G Avenue SE, Suite 240, Kirtland AFB NM 87117-5670, for approval before publication.

SUMMARY OF REVISIONS

This document is substantially revised and must be completely reviewed.

This pamphlet replaces Air Force Pamphlet (AFP) 127-1, volumes I and III. It is a completely rewritten and reorganized product, reflecting updates in terms and office symbols and the addition and deletion of many requirements and procedures. The previous pamphlet was organized by individual board member duties. This revised pamphlet is designed for ease of use based on the timeline of a typical safety investigation, from preplanning through initial response, ISB, SIB, and generation of the investigation report.

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PART 1

PREPLANNING FOR MISHAP RESPONSE

Chapter 1

THE USAF SAFETY INVESTIGATION -- AN OVERVIEW

1.1. Introduction:

1.1.1. Each year, the Air Force trains over 400 military and civilian personnel in safety investigation procedures and techniques through the Aircraft Mishap Investigation Course (AMIC), the Flight Safety Officer (FSO) Course, the Jet Engine Mishap Investigation Course (JEMIC), the Board President's Course (BPC) and other specialized safety investigation training. While many of these people eventually use their newly acquired expertise to conduct investigations into relatively minor mishaps, few are ever exposed to the rigors of a Class A mishap investigation as members of a "Safety Investigation Board" (SIB).

1.1.2. Most wings go years without having a mishap requiring a formal investigation. Consequently, Disaster Response Force (DRF) plans, Mishap Response Plans (MRP), and Interim Safety Board (ISB) training become low priority items. In addition, investigation management skills get rusty when they are not used, and the high-pressure, stressful environment of a major mishap is no place to try to recapture lost knowledge.

1.1.3. Despite the Air Force's long-standing record of reducing major mishaps, many people still get the fateful call in the middle of the night. Typically, such a call is the start of the first investigation for most of the newly formed SIB members. They suddenly find themselves faced with the awesome responsibility of digging through rubble for physical clues and sifting through literally thousands of bits of information to determine the cause of the mishap and recommend how to avoid one like it in the future.

1.1.4. This pamphlet is designed for people already trained in the fundamentals of mishap investigation. It is a ready reference and a source of guidance and ideas for those who find themselves involved in a truly life-or-death enterprise -- the investigation of a major mishap.

1.2. Why Investigate Mishaps? The purpose of every safety investigation is to determine all factors (human, materiel, and environmental) that directly or indirectly contributed to the mishap. This information is used by aircrews, equipment operators, supervisors, commanders, staffs, and designers to eliminate cause factors and thus help prevent recurrence of similar mishaps. The proper use of mishap experience reduces mishap potential, since each safety investigation adds to the overall USAF mishap experience, providing a basis for corrective action. Investigative findings and recommendations may determine the requirements for additional training, validate a need for increased frequency of maintenance, justify improvements to materiel, establish future design criteria, and achieve other long-range results. Thus, the accuracy and thoroughness of each investigation determines the ultimate adequacy of action taken to remove or eliminate factors that cause or contribute to mishaps.

1.3. Using This Pamphlet:

1.3.1. Philosophy:

1.3.1.1. The key to a successful investigation is proper organization and management of the many tasks and skills required to determine mishap causes. Since a safety investigation spans a significant time, organizational challenges are best addressed chronologically. Since a safety investigation must dovetail and coordinate with other activities, such as writing the formal investigation report and producing a briefing for the convening authority, SIB members need to understand how their activities interrelate, and how to prioritize their tasks to ensure everything comes together.

1.3.1.2. Investigations can be straightforward, or they can be jigsaw puzzles. If the crew survives, the aircraft is equipped with a flight data recorder, or the crew declares an in-flight emergency, the SIB at least has a place to start. Unfortunately, the needed clues often lie in the wreckage, the morgue, or the perceptions of family and associates. In these situations, the SIB must discover these clues, analyze them, and put the puzzle together.

1.3.1.3. AFPAM 91-211 is nondirective in nature. This is deliberate, since every mishap is different, and SIB members are expected to use their best judgment and functional expertise to run an investigation uniquely tailored to address the circumstances at hand. The prospect of participating in a major mishap investigation can be daunting, and the complexity of most mishap scenarios mandates a systematic approach. However, this pamphlet merely provides a starting point, and serves as a tool for helping boards develop their strategy for conducting the investigation. Nothing in this pamphlet restricts the use of other investigative techniques; SIB members must feel free to alter their investigative process to fit a specific situation.

1.3.1.4. The central theme of this pamphlet is *continuity*. At some point, every task described must be properly accomplished ensuring a complete investigation, correct findings, and useful recommendations. Because the primary purpose of an investigation is to prevent future mishaps, the timely release of pertinent information must also be stressed. Therefore, when faced with a mishap where the orderly flow described above is not possible, ISB and SIB members must be prepared to react quickly and improvise as necessary to ensure the investigation is not compromised.

1.3.2. Layout of Material. Reading this pamphlet from cover to cover may lead the reader to conclude it repeats itself unnecessarily. However, its layout is intended to meet the needs of people reacting to a major mishap, when time is short and the completion of certain tasks at certain times is critical. The Air Force Safety Center (AFSC) has designed this pamphlet with the needs of many users in mind, each of whom has certain time-sensitive concerns. Thus, it may be used at various times by exercise or disaster response planners, ISB members, or SIB members, before, immediately after, or during a major mishap investigation. Since their responsibilities interrelate and sometimes overlap, the guidance occasionally overlaps as well.

1.3.3. Target Audience. This pamphlet serves as a ready reference for all assigned board members to refresh their memories as to their specific duties, and to offer a generic strategy for accomplishing them. Geared toward the particular needs of flight mishap investigations, many of the techniques described may be useful when investigating other categories (ground, space, missile, etc.) of mishaps.

1.3.4. Content Review. When using this pamphlet during field investigations, boards will inevitably find some of its guidance valuable, discard some of it, and modify some to fit their particular needs. HQ AFSC will periodically update both the pamphlet and investigation courseware to include useful lessons learned. SIB members should submit suggestions to improve its quality and make it a better

product. Either direct correspondence with Aviation Safety Division (AFSC/SEF) or Tab Z of the formal report (see [Chapter 8](#)) may be used for this purpose.

1.4. Investigation Phases. The safety investigation process can be divided into six phases: preparation, notification, ISB, SIB arrival, investigation and analysis, and report/briefing production.

1.4.1. Preparation Phase. This period encompasses several activities all of which are ongoing and recurring, but interact and are essential to effective response if there is a mishap.

1.4.1.1. Disaster preparedness personnel develop, update and exercise Disaster Response Force (DRF) plans, assisted by their supporting safety staffs.

1.4.1.2. Operations personnel develop, update, and exercise Crisis Action Team (CAT) procedures, which include reaction to downed and missing aircraft.

1.4.1.3. Wing safety staffs develop, update, and exercise mishap response plans specific to their aircraft, facilities, and operational taskings.

1.4.1.4. Wing commanders or their safety staffs identify potential board members, both for local use as ISB members and for possible assignment by their Major Command (MAJCOM) to a SIB. They may be locally trained as ISB members, used strictly to perform duties in response to a mishap at their installation, or they may be fully trained through one of the formal United States Air Force (USAF) safety investigation courses and available for appointment to a SIB anywhere in the world.

1.4.2. Notification Phase. Typically, the following sets of actions take place when Air Force personnel are notified of a major mishap involving Air Force resources:

1.4.2.1. The nearest USAF installation activates its DRF (to respond to the scene of the mishap) and CAT (to manage the resulting operational impact); in addition, the installation commander coordinates with the safety staff to assemble an ISB (see para [1.4.3.](#)).

1.4.2.2. The MAJCOM owning the aircraft involved in the mishap selects and notifies qualified individuals to serve on the SIB.

1.4.2.3. If the mishap is a Class A flight mishap, HQ AFSC deploys an action officer to serve on the SIB.

1.4.3. ISB Phase. The ISB plays a vital role in the first few hours, and sometimes days, after a mishap. The ISB president assumes control of the wreckage when the DRF's on-scene commander declares the site safe (in rare cases, the on-scene commander may also be identified as the ISB president). The ISB ensures perishable evidence is preserved by identifying air traffic control tapes and surveillance video tapes for impoundment, notifying the owning installation of the need to collect aircraft and crew records, impounding all equipment which may be related to the mishap event, collecting perishable fluids, photographing the crash site, removing to a secure location the voice and flight data recorders, and advising en route installations and airports visited by the mishap aircraft prior to the accident so servicing people and equipment can be identified. The ISB also lays the groundwork necessary to ensure a smooth hand-off to the SIB. [Chapter 4](#) and [Attachment 3](#) cover ISB procedures.

1.4.4. Arrival Phase. This is the time immediately after the SIB arrives at the mishap location. The ISB briefs the SIB members on the location and condition of the scene, the status of evidence collection and preservation, and other relevant information as necessary. They also refamiliarize themselves

with the specific requirements and duties of the position they hold on the board (investigating officer, pilot member, recorder, etc). Ideally, these steps are accomplished before the SIB proceeds to the scene to make an initial walkthrough.

1.4.5. Investigation and Analysis Phase. The SIB spends most of its time in this phase, gathering, sorting, and evaluating evidence to discover any deficiencies that may affect safety, which should be addressed immediately and for the production of a completed report, final message and briefing for the convening authority.

1.4.6. Report Production Phase. This begins from the first moment the Air Force is notified of a major mishap, and continues throughout the investigation. Factual information, including flight plans, weather forecasts, maintenance and training records, etc., is assembled and merged with the board members' analysis to develop a clearly written, well-documented report. Therefore, components of the report are gathered by the ISB, but the SIB is responsible for the final product. In most cases, the SIB president develops his briefing on the mishap concurrent with the preparation of the written report.

1.5. Unusual Circumstances. As stated previously, no two mishaps are alike. The preceding paragraph is generally applicable to typical mishaps. However, planners and potential SIB members should remember that there are a number of possible scenarios where the sequence of events cannot be neatly organized. The following represent a few such possibilities, each of which could present different investigative challenges:

1.5.1. Aircraft from X Air Force Base crashes at X Air Force Base.

1.5.2. Aircraft from X Air Force Base crashes at Y Air Force Base.

1.5.3. Aircraft from X Air Force Base crashes at a civilian facility.

1.5.4. Aircraft from X Air Force Base crashes in isolated area in the Continental United States (CONUS).

1.5.5. Aircraft from X Air Force Base crashes near a sister service installation.

1.5.6. Aircraft from X Air Force Base crashes away from Air Force facilities outside CONUS.

Chapter 2

INTERIM SAFETY BOARDS AND SAFETY INVESTIGATION BOARDS

2.1. Introduction. Most major Air Force mishaps are investigated by a board of officers convened by a MAJCOM commander under the provisions of AFI 91-204, *Safety Investigations and Reports*. This board is referred to as a “Safety Investigation Board” (SIB) to distinguish it from the “Accident Investigation Board” (AIB) that is convened under the provisions of AFI 51-503, *Aerospace Accident Investigations*. The minimum required membership for a given SIB is at least partially dependent on the circumstances surrounding the mishap. However, some SIB members are mandatory for all mishaps involving Air Force aircraft. Paragraphs 2.3. and 2.4. below provide a brief discussion of each SIB member’s responsibilities and duties.

2.2. Types of Safety Boards. There are two types of boards, each of which performs a specifically defined function.

2.2.1. Interim Safety Boards (ISB). Interim safety boards are convened by individual wing/group commanders to provide an organized, evidence preservation-oriented response to major mishaps within their area of responsibility before the arrival of the SIB. The Air Force does not impose specific training requirements on individual members of ISBs, since their duties are only minimally analytical and technical in nature. ISB members are characterized by and selected based upon their respective expertise within their normal professional specialty.

2.2.2. Safety Investigation Boards (SIB). SIBs are convened by the MAJCOM commander, normally in response to Class A mishaps. Lower echelon commanders may also convene a SIB if the broad expertise and objectivity afforded by their structure is desired to investigate a less serious mishap, Class B or below. SIBs fulfill the requirement imposed by DoD directives to fully investigate major mishaps with the objective of preventing the recurrence of similar mishaps in the future. They are sometimes referred to as “formal boards” because of the product -- the “formal report” -- they develop documenting their investigations’ analysis, findings and recommendations.

2.3. ISB Membership. AFI 91-204 deliberately avoids prescribing a specific list of mandatory members for ISBs. However, experience has proven that initial fact gathering and subsequent hand-off between ISB and SIB members is greatly facilitated by the SIB members having a direct counterpart on the ISB. It is convenient to divide information collection tasks functionally, and it is helpful to have people of like expertise and training communicating with each other when it is time for the SIB to assume responsibility for the investigation. Generally, an ISB will consist of at least the following:

2.3.1. ISB President: The ISB President is, typically, the supporting wing’s Operations Group commander or equivalent. The ISB president ensures initial investigative responsibilities are carried out, evidence is preserved, and the installation is prepared to provide all necessary support to the SIB upon their arrival.

2.3.2. ISB Investigating Officer (IO): A trained flight safety officer whose principle function is to ensure preservation of physical evidence at the scene of the mishap and is the ISB counterpart of the SIB’s investigating officer. Under ideal circumstances, the ISB IO is supported by a second trained flight safety officer, who assists the ISB president in the systematic gathering of documentary and testimonial evidence.

2.3.3. ISB Pilot Member: A pilot, preferably qualified in the mishap aircraft type, whose main function is to assemble as much factual information as possible regarding the history of the mishap flight and the qualifications of the mishap crew.

2.3.4. ISB Maintenance Member: Is normally a maintenance officer or senior Non Commissioned Officer (NCO), with experience in the mishap aircraft. His chief function is to assemble as much information as possible regarding the history of the mishap aircraft, its most recent servicing, and the qualifications of the individuals who most recently worked on it.

2.3.5. ISB Medical Member: This member is a flight surgeon whose main function is preservation of medical evidence. This member is also utilized in the following ways:

2.3.5.1. Assumes responsibility for the post-mishap medical history, examination, care and toxicological testing of mishap crewmembers as well as collection of their medical and dental records. They work to ensure human remains are photographed, preserved and documented. They also coordinate medical care at the mishap site and advise the ISB on environmental hazards found there.

2.3.5.2. A flight surgeon responding to the mishap may turn out to be the interim Medical Member. The responding flight surgeon travels to the scene of a mishap with fatalities or injuries in a professional medical capacity.

2.3.5.3. The interim medical member serves as liaison between local medical authorities or coroners and military investigators, including medical examiners from the Armed Forces Institute of Pathology (AFIP), if assigned.

2.3.6. ISB Recorder. An interim recorder may be appointed as a part of a base's Mishap Response Plan. This individual, normally a junior officer or senior NCO familiar with administrative duties, is responsible for ensuring the administrative and logistical needs of the ISB are met. If an interim recorder is appointed, he or she may be retained as the SIB recorder with MAJCOM and local agreement.

2.4. SIB Membership. Primary SIB members are the core team as specified by AFI 91-204. SIBs also include non-primary members.

2.4.1. The following are normally members of all SIBs:

2.4.1.1. SIB President. (Primary)

2.4.1.2. Air Force Safety Center Representative. (Primary)

2.4.1.3. Investigating Officer. (Primary)

2.4.1.4. Pilot Member. (Primary)

2.4.1.5. Maintenance Member. (Primary)

2.4.1.6. Medical Member. (Primary)

2.4.1.7. Commander's Representative. (Non-Primary)

2.4.1.8. Recorder. (Non-Primary)

2.4.2. In most cases, SIB members expand upon the responsibilities of their ISB counterparts. Their individual and collective expertise is brought to bear on first assembling and then analyzing all available evidence to arrive at findings and recommendations designed to prevent similar mishaps.

2.4.3. The explanation of how a SIB functions relates to a professional sports analogy; the convening authority is the team owner, MAJCOM safety personnel are advisors, the board president is the general manager, the AFSC representative is a playing coach, the investigating officer is the team captain and all other members are team players. Because of human dynamics and different styles of leadership and various levels of experience/knowledge, the amount of participation or direction at each level will vary for each SIB.

2.5. Responsibilities of Individual Board Members:

2.5.1. ISB Members. **Attachment 3, Section A3C** of this pamphlet contains a list of individual ISB member's goals and objectives. At MAJCOM option, ISB members may pattern their collection checklists after the SIB checklists contained in **Attachment 4**; however, raw data collected by this means should not be accompanied by interpretation or analysis.

2.5.2. SIB Members.

2.5.2.1. Attachment 4 of this pamphlet contains comprehensive checklists designed to help most SIB members collect relevant information toward development of findings and recommendations. The following SIB members duties are less specific:

2.5.2.1.1. The Air Force Safety Center (AFSC) Representative works directly for the Board President and is charged with generally facilitating the proceedings of the entire board. This will include helping the SIB president and investigating officer formulate an overall investigative strategy and schedule or lending his/her expertise to specific investigative issues. Because the AFSC representative will normally have completed multiple SIBs and reviewed many others, he or she is considered the expert regarding the process and is included in all aspects of the investigation. The AFSC representative's specific duties include:

2.5.2.1.1.1. Leading the findings and recommendations phase/sessions of the investigation by first educating SIB members on the process and then guiding the SIB through the development of factors, findings, causal findings, and recommendations as well as Other Findings and Recommendations of Significance.

2.5.2.1.1.2. Ensuring that the formal report is complete, consistent, and in compliance with AFI 91-204, particularly with regard to protecting privilege. The SIB recorder will rely upon the AFCS representative for direction in virtually all aspects of his or her position.

2.5.2.1.1.3. Acting as the SIB's conduit for requesting technical assistance or manufacturer/contractor participation.

2.5.2.1.2. The Commander's Representative for flight mishaps is typically a pilot, usually qualified in the mishap aircraft, not necessarily trained as a flight safety officer. However, it is not unusual for the commander's representative to be a maintenance officer if the mishap initially appears to be maintenance related. This individual is considered the expert on local procedures, local command relationships/structure and unit personalities. He may also be

employed as an additional interviewer, courier for components requiring personal escort for teardown or other analysis, and other general-purpose board operational and support tasks.

2.5.2.2. Depending on the level of investigative effort associated with a particular mishap, the SIB president may elect to subdivide the board into functional teams. Under this arrangement, most primary members become leaders of their respective functional teams. [Figure 2.1.](#) illustrates a typical division of labor for complex investigations.

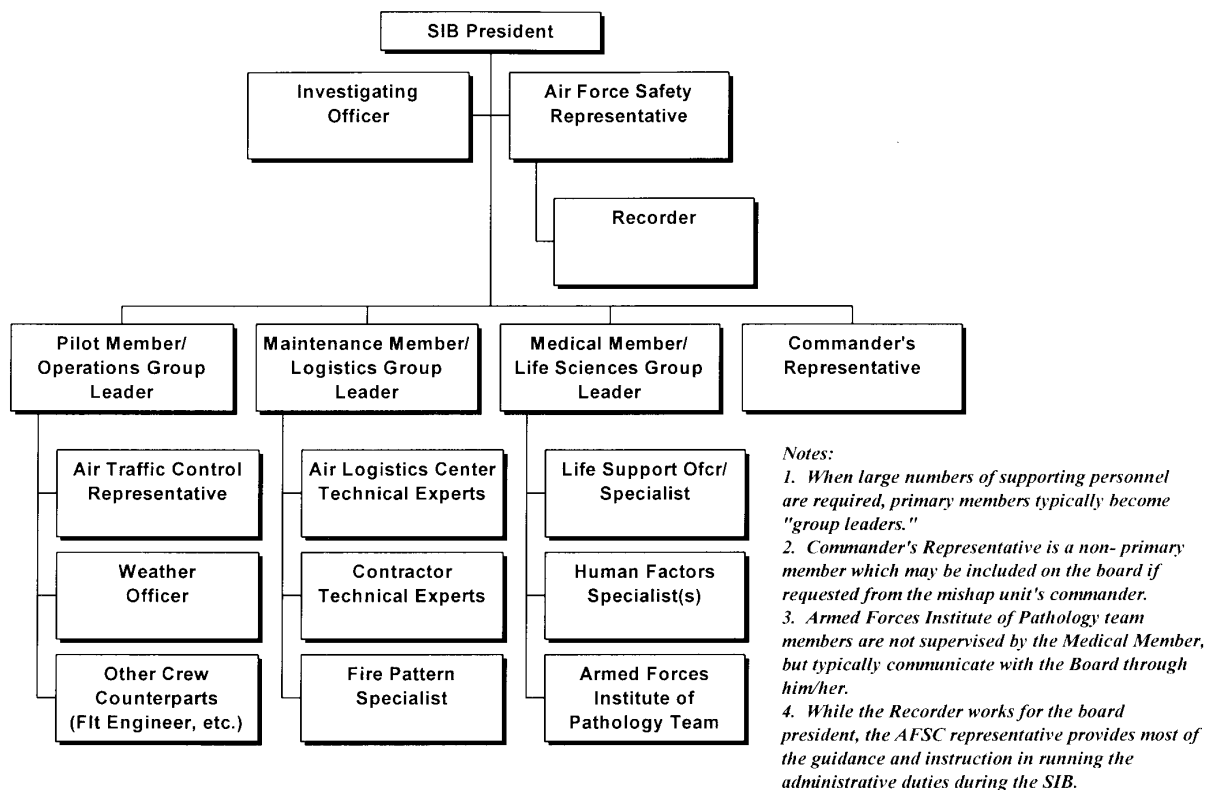
2.6. Hand-off Between ISB and SIB Members:

2.6.1. An official hand-off between ISB and SIB members is essential to the continuity of the investigation. In its simplest form, such a hand-off need only involve individual members meeting with their counterparts to review physical, documentary, and testimonial evidence collected to date. More structured handoffs may include a formal mass presentation chaired by the ISB president. This formal presentation is designed to orient the SIB members to the crash scene, local conditions, and logistical arrangements. This is preferable and should be used any time the scene is at a significant distance from the prearranged workcenter, when there are significant hazards associated with the scene, or when a significant amount of evidence has already been collected.

2.6.2. The hand-off between boards marks the end of the ISB's involvement in the investigation. This is typically a difficult transition to make, particularly when the mishap aircraft and crew came from the ISB's home base. SIB's must consciously draw a line between the activities of the ISB and their own. The ISB must be politely but firmly excluded from the SIB's deliberations, and they must be removed from the roster granting access to the crash site as soon as practical. Nevertheless, the ISB represents corporate knowledge that must remain available to the SIB for some time after the hand-off. ISB members must be prepared to verify the accuracy of transcripts produced from any witness interviews. ISB members generally need not remain readily available more than about five workdays following the SIB's arrival; however, they should not assume they are no longer needed until definitely excused by the permanent SIB president.

2.6.3. A sample hand-off briefing is provided at [Attachment 3](#), paragraph [A3.11.3.](#).

Figure 2.1. Safety Investigation Board Organization (Typical).



Chapter 3

PREPARATION FOR MISHAP RESPONSE AND INVESTIGATION

Section 3A—Base Disaster Response Force (DRF)

3.1. Introduction. Although the activities of the base DRF are not the responsibility of the safety staff, ISB or SIB members, local safety personnel actively participate in developing and testing DRF procedures. This participation provides a feel for what other base agencies do when a mishap occurs, and helps safety personnel determine the kinds of assets available on base while giving them an opportunity to help educate DRF members in investigative "DOs" and "DON'Ts." This section familiarizes safety personnel with general DRF planning and execution principles. It should be used in formulating mishap response plans and as a part of initial and refresher training for ISB members.

3.2. DRF Response. The DRF normally consists of four elements: command post, control centers, disaster control group (DCG), and specialized elements. Membership in these elements varies due to the resources available at the installation and the location of the mishap. The key element of the DRF is the DCG because it is headed by the on-scene commander (OSC) who responds to the scene of mishaps. The DCG in turn is divided into two sub-elements: initial response element and follow-on element. The following describes these sub-elements for both on-base and off-base responses.

3.2.1. On-Base or Near-Base Response:

3.2.1.1. The initial response element consists of the following representatives who respond directly to an on- or near-base mishap site:

3.2.1.1.1. Fire fighting.

3.2.1.1.2. Medical.

3.2.1.1.3. Security forces.

3.2.1.1.4. Additional representatives as directed by the OSC (depending on the situation), including maintenance, civil engineering, and munitions or explosive ordnance disposal (EOD) personnel.

3.2.1.2. The follow-on element consists of the following representatives who respond directly to a preplanned assembly point for a directed response. The follow-on element departs when directed by the initial OSC (Fire Chief) who determines a safe route into the scene.

3.2.1.2.1. Readiness Flight.

3.2.1.2.2. Civil engineering.

3.2.1.2.3. Bioenvironmental engineering.

3.2.1.2.4. Maintenance.

3.2.1.2.5. Munitions or EOD.

3.2.1.2.6. Public affairs.

3.2.1.2.7. Safety officer.

3.2.1.2.8. Additional medical and security personnel, as required.

- 3.2.1.2.9. Mortuary affairs.
- 3.2.1.2.10. Transportation.
- 3.2.1.2.11. Chaplain.
- 3.2.1.2.12. Procurement.
- 3.2.1.2.13. Tenant unit representatives.
- 3.2.1.2.14. Finance.
- 3.2.1.2.15. Staff judge advocate.
- 3.2.1.2.16. Alert photographer.

3.2.2. Off-Base (Remote) Response. If the mishap site is off base and its exact location is unknown, or expeditious travel to the site is in doubt, the initial response element proceeds to the predesignated assembly point and awaits further instructions. If available, the DRF should scramble helicopter support for the initial response element and OSC.

3.2.2.1. The initial response element consists of the following representatives, who respond to the designated rendezvous point when the mishap requires an off-base remote response. The first helicopter scrambled, (if available) or the first vehicle to depart, transports the medical representative(s) and any of the remaining members of the initial response element who are ready for departure. Space may be at a premium, so thought must be given to which members are the most logical to send ñ this will depend solely upon the circumstances of the mishap and the amount of information available. Once the medical representatives are aboard, departure must not be delayed for other personnel. The following remaining element personnel convoy to the site when directed by the OSC.

- 3.2.2.1.1. Medical.
- 3.2.2.1.2. Fire chief (if fire is not extinguished).
- 3.2.2.1.3. OSC.
- 3.2.2.1.4. Security forces (2 persons).
- 3.2.2.1.5. Safety officer.
- 3.2.2.1.6. Alert or on-call photographer.
- 3.2.2.1.7. Maintenance.
- 3.2.2.1.8. Civil engineering.

3.2.2.2. Follow-on element members are the same as those in the on-base or near-base response, except that the public affairs and mortuary affairs representatives should travel by helicopter to remote mishap sites if possible.

3.3. Locating Downed Aircraft:

3.3.1. General. The DRF is responsible for pinpointing and determining how to reach an off-base mishap as quickly as possible. There is nothing more frustrating than to know that a mishap has occurred, then learning that the fire trucks and ambulance are unable to reach the scene because the location has not been properly identified. Locating wreckage in overseas areas may present additional

challenges, particularly where terrain is rough, communications are sparse, or language barriers are present. Host government military personnel or local nationals from US overseas installations can be extremely helpful.

3.3.2. **Maps.** Base civil engineering normally prepares the base grid map and keeps it current. The Readiness Flight staff (or equivalent) should identify maps that cover their base's area of responsibility for off-base mishap response, preferably with a grid system for easy location of any point on the map. Detailed specialty maps, such as US Forest Service maps, are especially valuable if available. Copies of the off-base response area map should be posted at base operations, control tower, crash rescue and fire sections, hospital, security forces office, wing command post, and control centers, and should be immediately available in the base safety office. They should also be available in sufficient numbers for a copy to be provided to all vehicles and search aircraft used in response to an off-base crash.

3.4. Emergency Communications. The host installation safety office must be on at least the secondary crash net, and should participate in regular system checks.

3.5. Proceeding to the Scene. When a mishap occurs on an airfield, crash/fire/rescue (CFR) crews usually reach the scene with minimum delay. For off-base mishaps, it is likely that post-impact fire will have done its damage by the time the first trucks arrive. However, crewmembers will require medical attention and aircraft wreckage can start secondary fires that local authorities may not be equipped to fight alone. Depending upon mishap circumstances, i.e. in a congested area, civilian injuries and damage to structures are also possible. Because of these possible situations, CFR vehicles usually constitute the first of two separate convoys sent to a mishap scene. The CFR convoy is then closely followed by a second convoy made up of vehicles associated with the initial response element described above.

3.5.1. **CFR Vehicles and Ambulances.** Immediately upon notification, CFR vehicles and ambulances proceed directly to the scene, using a grid map for directional instructions. Additional medical personnel go directly to off-base scenes by helicopter (if available). The chief of safety should ensure CFR and ambulance personnel are periodically reminded to accomplish their primary tasks with the fewest possible disturbances to the wreckage to prevent loss of or damage to physical evidence.

3.5.2. **Other Essential Personnel.** Other essential personnel not in the immediate reaction group convoy to the scene as required. Readiness Flight personnel designate an assembly point, such as base operations, and ensure the person leading the convoy is well acquainted with the roads and has a radio-equipped vehicle.

3.6. Command and Control at the Mishap Site:

3.6.1. The fire chief or senior on-duty fire fighter is in command of the mishap scene until the fire is extinguished and rescue efforts are completed, or until relieved by the OSC. The fire chief's crash site responsibilities include fire and damage control, rescue, and first aid, with emphasis on recovery and treatment of survivors.

3.6.2. After extinguishing the fire and ensuring casualties are under the care of qualified medical staff, the fire chief briefs the OSC on the mishap site status and subsequent priorities. The OSC then assumes control of the mishap scene. Normally, the OSC will not assume control of the scene until it is declared safe.

3.6.3. The OSC sets up a control point, establishes communications with the parent installation, and directs the activities of support and supplementary services, including the following:

- 3.6.3.1. Casualty clearance (coordinating assistance for rescue and medical personnel at the casualty site).
- 3.6.3.2. Helicopter and ambulance access (selecting and controlling helicopter landing zones, ambulance routes, and marshaling areas for casualty evacuation).
- 3.6.3.3. Security Forces (traffic and crowd control, security of wreckage, and support vehicle parking plan/execution).
- 3.6.3.4. Other fire services, including civilian auxiliary fire service assistance as necessary.
- 3.6.3.5. Engineering (specialist support as required for recovery of the injured and clearing of access routes).
- 3.6.3.6. Public affairs (handling information requests from the news media).

NOTE: Safety participants in the DRF must ensure that all personnel likely to be moving about the crash site know not to disturb the wreckage, and are aware of the hazards associated with the mishap. These include shock and fire-damaged components such as carbon fiber, hydrazine, fire extinguishers, pressure vessels, landing gear and tires, and other pressurized and flammable systems, as well as other hazardous materials used in the construction of the mishap vehicle. These hazards are discussed in detail in [Chapter 5](#).

Section 3B—Safety Staff Preparation for Mishap Response

3.7. MAJCOM Preparation:

3.7.1. Safety Investigation Board Readiness. MAJCOM safety staffs maintain two separate processes to ensure they are ready to respond to mishaps involving their resources:

- 3.7.1.1. Candidate Board Member Identification and Training: each MAJCOM establishes policies and procedures for identifying and training candidates for ISB and SIB duty. These procedures account for all assigned assets, identify personnel availability and shortfalls by weapon system, and may include establishment of memoranda of agreement for intercommand support of investigations of mishaps involving small-population or specialized aircraft (helicopters, operational support airlift aircraft, etc.).
- 3.7.1.2. Mishap Response: Each MAJCOM establishes policies and procedures for selecting pre-identified, pre-trained personnel to safety investigation boards immediately upon notification. MAJCOM/CCs convene boards and publish the appropriate orders IAW AFI 91-204.

3.7.2. Investigation Funding. Major commands provide the funds as necessary to ensure thorough investigation of mishaps as required by AFI 91-204, as well as their subsequent remediation (clean-up). Costs incurred during typical investigations fall into two categories: direct and indirect.

- 3.7.2.1. *Direct costs* are those that are directly attributable to the loss of an aircraft, associated loss of life, and property damage directly resulting from the mishap.

3.7.2.2. *Indirect costs* are those that are incurred during the investigation process (travel and per diem costs for board members, specialized technical assistance not provided for by existing contracts, site security, wreckage recovery, site restoration, etc.).

3.7.3. Mishap investigations can be “budget busters” for the installations that support them. This is particularly the case with installations that wind up supporting another command’s mishap. Therefore, major commands are responsible for programming sufficient excess operations and maintenance (O&M) funds to cover the expense of a typical year’s worth of investigations. Two exceptions to MAJCOM funding as described above are provided in AFI 91-204:

3.7.3.1. Travel of Air Logistics Center (ALC) personnel and technical experts they contract for in support of mishap investigations is funded by the supporting ALC.

3.7.3.2. Each command funds TDY travel of its assigned personnel who are Air Force SIB members IAW AFI 65-601, Vol 1 *Budget Guidance and Procedures*, para. 7.14.

3.7.3.3. Travel of Air Force Safety representatives is funded by HQ AFSC.

3.8. Base Preparation:

3.8.1. Host Installation Safety Staffs:

3.8.1.1. The host safety staff for each installation develops a Mishap Response Plan (MRP) as described in AFI 91-202, *The USAF Mishap Prevention Program* and AFMAN 32-4004, *Emergency Response Operations*. Major commands may establish specific formats for installation MRPs; suggested planning considerations are in [Attachment 2](#) of this pamphlet. The MRP should specifically ensure that at least the minimum support described in AFI 91-204, *Investigating and Reporting US Air Force Mishaps*, is provided to the ISB and SIBs.

3.8.1.2. Each installation should exercise their MRP periodically to test it and to train potential participants and responding agencies.

3.8.1.3. Host safety staffs should ensure they understand and are prepared to manage responses throughout the local “area of responsibility” established by their base Readiness Flight or equivalent organization.

3.8.1.4. Host safety staffs are responsible for contacting their counterparts at neighboring DOD installations to ensure all parties understand each other’s response plans and capabilities if there is an aircraft mishap.

3.8.2. Special Considerations for Air National Guard (ANG) and Air Force Reserve Command (AFRC) Safety Staffs:

3.8.2.1. Air Reserve Component (ARC) installations maintain as comprehensive a response capability as practical consistent with local mission and resources.

3.8.2.2. Contact with nearest active duty installations to obtain backfill of unavailable resources is highly recommended; memoranda of agreement should be concluded between ARC and active duty installations to ensure adequacy of response and availability of major assets, such as heavy equipment.

3.8.3. Additional Planning Factors. Base MRPs should consider special needs of tenant or transient organizations regularly operating aircraft from the host installation. Supporting base MRPs may

require specific procedures and provisions to secure crash sites and dispatch investigation teams to mishaps involving aircraft that are regularly operated in detached status (leased or loaned aircraft, test aircraft, etc.) at non-USAF locations.

PART 2

RESPONDING TO A MAJOR MISHAP

Chapter 4

WING STAFF AND INTERIM SAFETY BOARD RESPONSE

Section 4A—General

4.1. Introduction. This chapter outlines the immediate steps to limit damage and protect resources, and emphasizes the areas that should be of interest to supporting wing commanders, group commanders, safety officers, and ISB members in the wake of a mishap. While the assignment of responsibilities may vary due to available resources and the type of mishap, the responsibilities themselves stay essentially the same. The items discussed apply to the most serious, disastrous, or catastrophic types of mishaps. The degree of response and specific actions required in each case vary and can only be determined by accurate and timely on-scene judgment. Nothing in this chapter is intended to replace good judgment or imply that all actions must be taken in every case.

4.2. Objectives vs. Procedures. This chapter is designed to give individual wing staff and ISB members a general understanding of their respective roles and responsibilities following a major mishap. Itemized steps for task accomplishment and information gathering must be tailored to individual wing and base missions; however, generic checklists by wing and board position are provided in [Attachment 3](#) as a starting point. Wing staff and SIB members should review their procedures and checklists after mishaps and Major Accident Response Exercises (MARE), or at least annually, to ensure local procedures are technically correct, properly arranged, and updated as required.

Section 4B—Individual Wing Staff Responsibilities

4.3. General Information. AFI 91-204 requires the nearest USAF installation to respond to and provide support for mishaps. The following paragraphs explain the responsibilities of supporting wing staffs. (Refer to [Figure 4.1.](#) and [Figure 4.2.](#) for typical wing structure.)

4.4. The Supporting Wing Commander:

4.4.1. Role. The supporting wing commander (WG/CC) may have as many as three broad responsibilities in the aftermath of a major mishap:

4.4.1.1. Providing a timely and effective response to the mishap scene.

4.4.1.2. Supporting the activities of the ISB, SIB and the Accident Investigation Board (AIB).

4.4.1.3. Ensuring complete clean up of the mishap scene once all investigative activities are completed.

4.4.2. Objectives. The supporting wing commander can best fulfill the above responsibilities by ensuring maximum support to, and minimum interference with, all post-mishap activities.

4.4.3. Procedures. Refer to [Attachment 3](#).

4.5. Support Group Commander:

4.5.1. Role. The support group commander (SPG/CC) is responsible for the success of the Disaster Response Force, essential security, communications, services, and engineering support throughout the investigation, as well as all follow-on environmental clean-up activities.

4.5.2. Objectives. The support group commander can best fulfill the above responsibilities by ensuring:

4.5.2.1. Speedy response to the scene.

4.5.2.2. Immediate care for the injured (in cooperation with the Medical Group Commander/head of medical treatment facility).

4.5.2.3. Prompt, meticulous search and recovery (SAR) team and mortuary affairs operations.

4.5.2.4. Expeditious repairs to private property and handling of claims resulting from the accident (in cooperation with the base Staff Judge Advocate).

4.5.2.5. Effective security for the scene.

4.5.2.6. Efficient billeting support for permanent board members.

4.5.2.7. Availability of other needed services upon request.

4.5.3. Procedures. Refer to [Attachment 3](#).

4.6. Operations Group Commander:

4.6.1. Role. The operations group commander (OG/CC) may have conflicting responsibilities in the aftermath of a major mishap:

4.6.1.1. As a commander, the OG/CC may have to help subordinates deal with the loss of a member or members of their organization.

4.6.1.2. As the ISB president, the OG/CC may have to manage extensive evidence protection/collection efforts, both at and away from the scene of the mishap.

4.6.2. Objectives. The guiding principle for operations group commanders is that *people come first*. If a mishap results in major losses, take care of your people first. To do so with a reasonable degree of peace of mind, make sure your interim boards can operate essentially autonomously for the first 8 to 12 hours after a major accident. The OG/CC can best fulfill the above responsibilities by ensuring:

4.6.2.1. Their installation's pre-accident plan is organized, up-to-date, and adaptable to all reasonably expected contingencies (loss of own aircraft, loss of transient aircraft, etc.).

4.6.2.2. Their subordinate organizations have procedures in place for efficient capture of documentary and physical evidence.

4.6.2.3. Their designated interim board members are properly trained, familiar with their responsibilities in case of a mishap, and periodically exercised.

4.6.3. Procedures. Refer to [Attachment 3](#).

4.7. Logistics Group Commander:

4.7.1. Role. The logistics group commander's (LG/CC) responsibilities can vary widely in the aftermath of a major mishap, depending on the nature of the resources involved and the extent of damage inflicted. Generally, the LG/CC is concerned with:

4.7.1.1. Assessing what resources have been damaged or destroyed.

4.7.1.2. Providing transportation to the scene for all who need it.

4.7.1.3. Supplying any needed personal or specialized equipment, including procurement/contracting as necessary.

4.7.2. Objectives. The LG/CC can best fulfill the above responsibilities by ensuring:

4.7.2.1. Pre-assigned duties for all logistics DRF members are clearly delineated and frequently exercised.

4.7.2.2. Impoundment actions are carried out promptly and efficiently.

4.7.2.3. Testing of involved aerospace ground equipment (AGE) is performed upon request.

4.7.2.4. Procedures are in place for swift activation of contingency motor pool, supply, and contracting operations.

4.7.3. Procedures. Refer to [Attachment 3](#).

4.8. Chief of Safety:

4.8.1. Role. The Chief Of Safety (COS) may have as many as three broad responsibilities in the aftermath of a major mishap:

4.8.1.1. Ensure a timely and effective response to the mishap scene IAW with the long-range plan.

4.8.1.2. Supporting the activities of the ISB and SIB.

4.8.1.3. Ensuring complete clean up of the mishap scene once all investigative activities are completed through the OSC.

4.8.2. Objectives. The COS can best fulfill the above responsibilities by ensuring:

4.8.2.1. A viable pre-accident plan is in place and frequently exercised, preferably in conjunction with a MARE.

4.8.2.2. Necessary investigation and board support supplies are on hand or immediately available.

4.8.2.3. Interim board members for all assigned aircraft, representing all assigned organizations and tenants, are appointed in writing and properly trained.

4.8.3. Procedures. Refer to [Attachment 3](#).

4.9. Medical Group Commander:

4.9.1. Role. The medical group commander (MDG/CC) (or head of the supporting medical treatment facility, as appropriate) will have two principle responsibilities in the aftermath of a major mishap:

4.9.1.1. Providing care to the injured.

4.9.1.2. Providing ongoing medical support to the investigation including preservation of medical evidence.

4.9.2. Objectives. Pre-accident planning considers all possible conditions under which care might have to be rendered within the supporting wing commander's area of responsibility. Also, that agreement is reached with local coroners/medical examiners clarifying jurisdiction and coordination procedures for human remains and expeditious forensic autopsies. Medical professionals can best fulfill their responsibilities by ensuring:

4.9.2.1. The SIB's medical member is accorded full access to clinical facilities, as necessary.

4.9.2.2. The SIB's medical member receives assistance with obtaining needed medical and dental records as well as coordinating drug testing blood/urine samples to and results back from AFIP as expeditiously as possible.

4.9.2.3. All potential medical responders are trained in basic mishap site evidence preservation and hazards.

4.9.2.4. Appropriate medical care is provided to investigators, security personnel, etc at the mishap site.

4.9.2.5. Critical Incident Stress Management (CISM) is made available and encouraged IAW AFI 44-153, *Critical Incident Stress Management*.

4.9.3. Procedures. Refer to [Attachment 3](#).

4.10. Safety Member of Disaster Response Force:

4.10.1. Role. The safety member of the DRF may become the ISB investigating officer. However, until the OSC allows access to the mishap site to the ISB, the safety member must remember the objectives of the DRF:

4.10.1.1. To rescue the injured.

4.10.1.2. To prevent or minimize fire damage to the wreckage.

4.10.1.3. To remove wreckage obstructing essential air or ground traffic or rescue and fire fighting services.

4.10.1.4. To make the site safe.

4.10.2. Objectives. The safety member of the DRF should always keep two goals in mind. Both directly relate to preserving evidence.

4.10.2.1. Preserving and Documenting the Mishap Site. The safety member of the DRF must work with the OSC to keep the mishap site as unchanged as possible:

4.10.2.1.1. Unnecessary vehicle movements must be curtailed, since they can obliterate vital ground scar evidence; single routes into and out of the area, enforced with cordons, should be established as quickly as possible.

4.10.2.1.2. Aircraft components must be left undisturbed if they pose neither a threat to survivors nor a hazard to the DRF; otherwise, it may not be possible to characterize damage as pre- or post-impact.

4.10.2.1.3. If the site is constantly changing or subject to significant changes in conjunction with survivor recovery actions, photograph every change as it happens.

4.10.2.1.4. Be cognizant of the potential for weather forces to change or obliterate evidence such as ground scars. Document conditions and place protective coverings as needed.

4.10.2.1.5. When it is necessary to disturb the site to reduce site hazards, document the conditions prior to their disturbance whenever possible.

4.10.2.2. Locating and Initially Interviewing Witnesses. This is the second most important action the safety member of the DRF can take, and should begin as soon as the site has been satisfactorily controlled, preserved, and photographically documented. Observations by witnesses to a mishap can form an important part of subsequent investigations. It is important to reach witnesses as soon as possible and record their observations, since memories are perishable and easily influenced by subsequent information. If witnesses have time to think about what they saw, they will modify their observations to what they think they should have seen. See [Chapter 7](#) and [Attachment 5](#) for more details on witness management; see [paragraph A3.12.2.2.](#) for an expanded discussion of how to target the search for useful witnesses.

4.10.3. Procedures. Refer to [Attachment 3](#).

4.11. Public Affairs Officer:

4.11.1. Role. The Public Affairs Officer (PAO) carries out the Air Force's responsibility to keep the public fully informed following major accidents, consistent with the needs of operational security. The PAO performs his/her duties in close cooperation with the supporting wing commander, the designated on-scene commander, and the ISB president.

4.11.2. Objectives. In the wake of a major mishap, the chief of public affairs is usually the sole individual authorized by the supporting WG/CC to interact with news media. In this capacity, the PAO's objectives are to:

4.11.2.1. Coordinate with media personnel to help identify and request witnesses or individuals who possess knowledge, photographs, film, wreckage parts, etc.

4.11.2.2. Help control news media access to the mishap site.

4.11.2.3. Coordinate news releases with the WG/CC and COS and JA before releasing them to the news media. Once the SIB is in place, all releases of factual information regarding the status of the ongoing safety and/or accident investigation to the media must be coordinated with the AIB president IAW AFI 51-503, Chapter 7. The SIB president and AFSC representative will ensure that any information provided to the AIB president for public release does not contain any privileged safety information or documents. Information or photographs released to the press, public, next of kin, or representatives will not contain the following:

4.11.2.3.1. Any information that speculates on, or purports to represent, the cause of the mishap.

4.11.2.3.2. Any statement suggesting responsibility or culpability on the part of any person.

4.11.2.3.3. Assertions or denials with respect to the proper operation of equipment or facilities.

4.11.2.3.4. Statements that tend to indicate legal liability of the government or persons involved in the mishap.

4.11.2.3.5. Classified information.

4.11.2.3.6. Photographs of casualties.

4.11.2.3.7. Information of a personal nature about any person involved in the mishap or the investigation.

4.11.2.4. Bona fide members of the press requesting any of the above information should be referred to the appropriate MAJCOM/PA. However, if classified information is involved, advise newsmen and photographers of federal laws (18 U.S.C. 793, 795, and 797) which make it a criminal offense for anyone to photograph, publish, or refuse to surrender classified information to the proper military authorities.

NOTE: The ISB or SIB will not authorize any release of information related to the mishap. The AIB may authorize release of information. As a technique, coordinate with the MAJCOM Safety office prior to release of any information related to the mishap.

4.11.3. Procedures. Refer to AFI 35-101, *Public Affairs Policies and Procedures*.

Section 4C—Interim Safety Board Duties and Responsibilities

4.12. The Interim Safety Board -- Philosophy and Perspective:

4.12.1. For the most part, participation by the entire ISB in base DRF initial response activities is of little or no value. The interim board's time is better spent in organizing, reviewing each member's duties, and assigning immediate tasks.

4.12.2. The ISB is not responsible for determining mishap cause, and nothing is gained by attempting to do so. The sole purpose of the ISB is to gather, preserve, and protect evidence. Investigation is normally limited to determining what evidence exists. The ISB only analyzes evidence when it will perish prior to arrival of the permanent SIB. The most frequent complaint voiced by SIBs is that ISBs excessively disturb evidence in an attempt to establish cause.

4.13. ISB Initial Actions. A well-written and executed MRP has the various participants executing their functions simultaneously under the direction of the wing (installation) commander and the ISB president. The number and complexity of initial actions following a mishap require all participants to have a firm knowledge of their responsibilities and investigative priorities. Personnel awaiting specific direction, searching for needed equipment, or duplicating tasks that were already accomplished, can lose valuable time and evidence. This paragraph provides an overview of actions to be taken immediately following a mishap; see [Attachment 3](#) for detailed lists of responsibilities during each phase of an investigation.

4.13.1. Immediately upon notification of a mishap within his/her area of responsibility, the wing commander and battle staff or contingency support staff (including a safety advisor) should immediately assemble, receive a status briefing, select and notify ISB members, review the MRP, and initiate necessary disaster response and interim board actions.

4.13.2. The DRF must take immediate action to secure the mishap scene and impound all physical and documentary evidence. This action is done on the WG/CC's authority, and is delegated to the OSC and various members of the ISB as appropriate. Initially, impound all equipment that serviced the mishap aircraft, other aircraft in the mishap flight, air refueling aircraft, etc. This equipment may be at multiple locations. When collected evidence conclusively indicates impounded items did not

play a role in the mishap and do not contain perishable evidence, they may be released. Release is normally granted from the SIB president. Many times during modern mishap investigations, key evidence is electronic in nature. Surviving aircraft in a mishap flight have flight data recorder and Head Up Display (HUD) videotape evidence that can easily be overwritten if it is not confiscated immediately and preserved for the SIB. If surviving aircraft fly for extended periods after the incident or have ground electrical power applied, the needed information is often overwritten. It is imperative that the ISB try to collect and preserve such evidence as soon as possible. For example; if two aircraft collide during a four ship flight, the ISB should procure all Cockpit Survivable Flight Data Recorder (CSFDR) information, all maintenance diagnostic data, ejection seat data recorder information, HUD and voice tapes from each aircraft whether or not they were directly involved. The composite data can be used to recreate the entire mishap flight digitally. The SIB can determine if the data is applicable and/or useful at a later date.

4.14. Hazards Associated with Aircraft Mishaps. When mishaps occur, the natural tendency is to rush to the scene to either help or observe. While this attitude may appear commendable, it actually creates its own safety hazard. Aircraft mishaps contain numerous hazards that can turn investigators into casualties. The best way to protect personnel during the initial phases of a mishap is to be aware of potential hazards, stay upwind of mishaps, and remain well clear of the mishap until professional guidance is available. Most mishaps involve hazardous materials (HAZMAT). HAZMAT are substances that can produce injury during mishaps in any of the following ways:

- 4.14.1. Toxicological injury--when the substance is ingested, inhaled, or comes in contact with the skin.
- 4.14.2. Thermal injury--when the substance freezes or burns.
- 4.14.3. Asphyxiation--when the substance displaces oxygen needed to breathe.
- 4.14.4. Radiation injury--when a radioactive material emits ionizing energy or particles that harm personnel.
- 4.14.5. Disease--from microbiological agents.
- 4.14.6. Mechanical injury--injury by explosive fragments, rocketing containers, explosive overpressures, etc.

NOTE: Many normally benign items, such as tires, batteries, beryllium mirrors, parachute oxygen bottles, hydraulic accumulators, etc., are potentially lethal in a post crash environment.

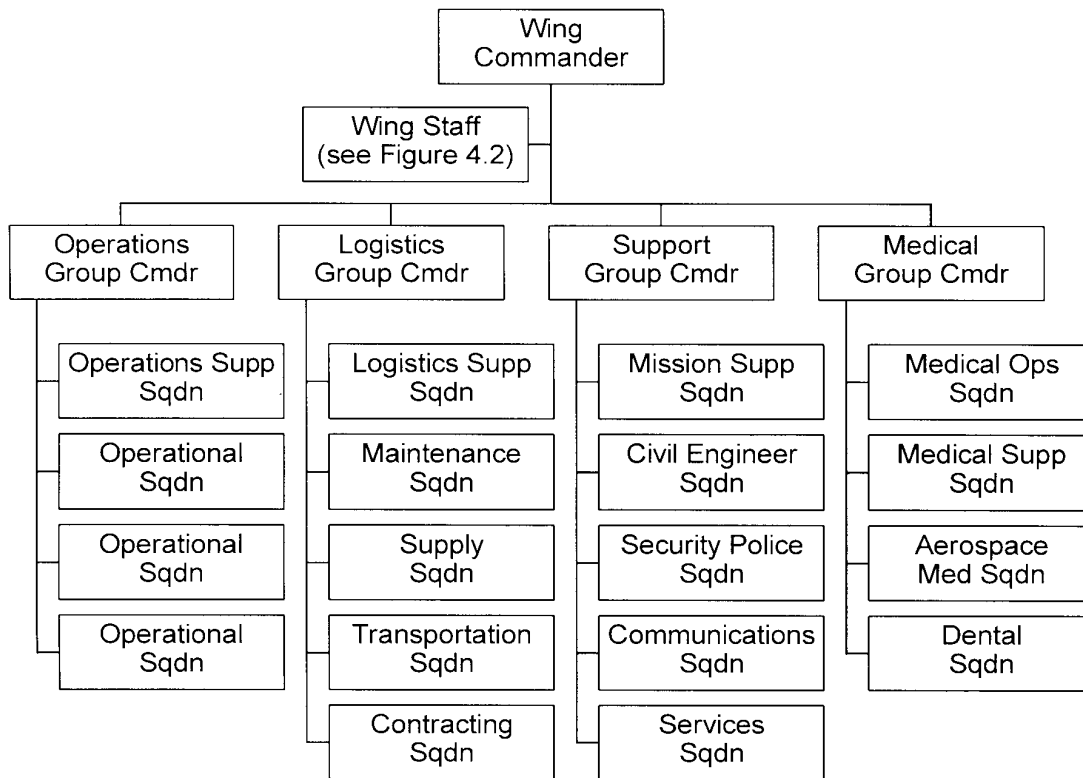
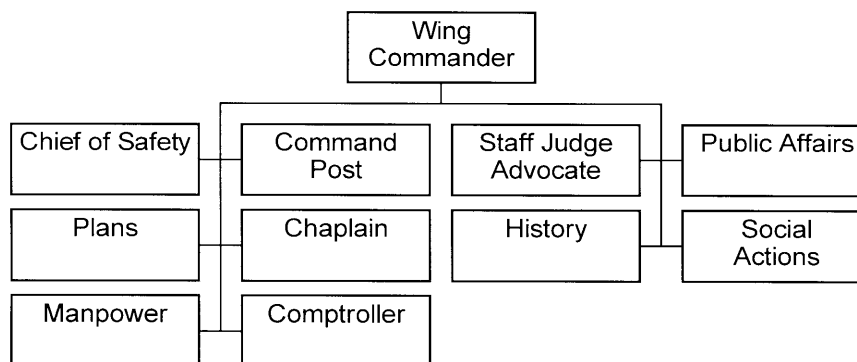
4.15. Avoiding Injuries at the Scene. The bioenvironmental engineer on the DCG, in conjunction with EOD and the fire department, can best provide guidance on the hazards specific for a given mishap. In addition, to avoid injuries to investigators in mishaps, the following four steps are suggested:

- 4.15.1. Expect HAZMAT to be present in any mishap until their presence has been ruled out. Anyone authorized to work in and around a crash scene must constantly be alert to indications of the possible presence of HAZMAT in any mishap. These materials may be indicated by warning placards or signs, labels on packages, shipping papers, or verbal information from people at the scene. Look for HAZMAT such as freight cargo, ejection seats, ordnance, fluids, and propellants. Also look for the presence of fuels, propellants, etc. HAZMAT may be dangerous even if it's seemingly contained, i.e. either packaged or in its usual containment vessel (fuel tank, pressurized system, etc.). Assume that HAZMAT is present until conclusively established that they are not.

4.15.2. Wait until potential energy transfers (such as fires, explosions, vapors, breached radioactive materials containers, etc.) are eliminated if HAZMAT is present. HAZMAT can be emitted in many ways for many reasons. Even worse, it is almost impossible to tell precisely when they will activate and envelope the danger zone with the investigator in it. Wait for those potential energy transfers to be eliminated. Use alternative methods for acquiring evidence in the wreckage. For example, aerial photographs, interviews with witnesses whose duties require them to go into the wreckage area, or subsequent examination of physical debris may provide the needed evidence. Consider the trade off between the value of the data acquired immediately from the wreckage area and the safety risks. Stressed containers have the potential for abrupt rupture, and the contents have the potential for an explosion until informed experts provide clear and convincing evidence to the contrary.

4.15.3. Follow, rather than lead, others into the wreckage area. A good rule of thumb is to stay away from the wreckage containing HAZMAT until a competent expert is available. Ask the expert to predict the behavior of the HAZMAT in that emergency. Ensure the predicted behavior poses no threat to personal safety. In those circumstances it may be permissible to follow him or her into the wreckage area. (Investigator ability to predict HAZMAT behavior is normally very limited because this is not usually his or her area of expertise.) If someone requests assistance or information, refer the person making the inquiry to the CHEMTREC emergency toll free telephone number (800-424-9300) for expert advice and assistance. Obey evacuation instructions of EOD, security forces/police, bioenvironmental engineers and fire fighters. In no event follow fire fighters or other emergency or rescue personnel into the wreckage area. Two rules of thumb are to stay at least 2,000 feet upwind from any fires burning in wreckage where HAZMAT are present and to stay out of any plume of smoke from the site.

4.15.4. Watch for potential hazards. If uncertainty about potentially destructive HAZMAT behavior in a mishap area exists, don't take chances by entering the mishap site. There is very little to be gained, and much to be lost, by risking personal safety. Remember, the investigator's role is to determine what happened, not to be a part of what is happening.

Figure 4.1. Objective Wing Organization (Typical).**Figure 4.2. Wing Staff (Typical).**

PART 3

INVESTIGATION PROCESS AND TECHNIQUES

Chapter 5

SAFETY INVESTIGATION BOARD PROCEDURES

Section 5A—Becoming Eligible for SIB Duty

5.1. Qualification. AFI 91-204 establishes minimum training requirements for some primary board member positions. Specifically, board presidents must be graduates of the HQ AFSC Board President's Course (BPC), which trains brigadier generals, colonels and colonel-selects to perform board president duties for both safety and accident investigation boards. In addition, investigating officers must be graduates of the FSO's Course or the AMIC.

5.2. Appointment:

5.2.1. MAJCOM/SEs determine specific procedures for identifying and tracking potential board members. In most cases, this is accomplished through unit-level nomination of qualified individuals.

5.2.2. All rated action officers assigned to HQ AFSC/SEF and the Policy, Plans, and Programs Division (AFSC/SEP) are eligible for duty as the HQ AFSC representative to a Class A Safety Investigation Board upon completion of in-house training. HQ AFSC representatives to SIBs must be graduates of the BPC and either AMIC or the FSO Course.

Section 5B—Assignment to SIB Duty

5.3. Convening Authority Actions:

5.3.1. MAJCOMs establish command specific procedures for:

5.3.1.1. Nominating potential members to the convening authority.

5.3.1.2. Dispatching selected members to the mishap locations.

5.3.1.3. Issuing administrative orders appointing primary and non-primary members of the board.

5.3.2. Three types of board members may be drawn from a base experiencing a Class A mishap at MAJCOM option:

5.3.2.1. Commander's representatives (see [paragraph 2.5.2.1.2.](#)).

5.3.2.2. Pilot member. If at all possible, the pilot member should be from other than the mishap wing. Certain circumstances (limited number of current and qualified pilots for a specific weapons system, only one base possessing a certain airframe within a command) force the convening authority to weigh this requirement with the actual availability of qualified personnel within the command. At the MAJCOM Commander's discretion, the pilot member may be chosen from within the mishap wing rather than going outside the command. This decision needs to be carefully weighed to ensure the integrity of the investigation process and not to place the pilot member in a difficult position. For these reasons, it is imperative that the pilot not be from the mishap unit.

5.3.2.3. **Recorders.** Normally, recorders come from the installation providing support to the SIB. However, many SIBs investigate mishaps in isolated or overseas locations and then return to centrally located USAF facilities to finish and publish the report. Ideally, a recorder should be selected based on the individual's qualifications and availability to the SIB from the beginning until distribution of the final report.

5.4. AF/SE Actions. The Air Force Chief of Safety dispatches a qualified member of the AFSC/SEF or AFSC/SEP staff as the Air Force Safety representative to each Class A board convened under AFI 91-204. Immediately upon selection of the AFSC representative, SEF will provide the convening authority's chief of safety with all necessary identifying information (name, rank, SSN, organization) for the nominated HQ AFSC representative to facilitate publication of orders.

Section 5C—Initial Activities Upon Arrival

5.5. First Meeting. It is generally preferable to gather as many of the primary board members as possible at the work center set aside for deliberations before going to the mishap scene. This establishes an early opportunity to raise board members mishap awareness and allows for early delineation of tasks to establish a common board purpose and avoid wasting time due to duplication of efforts. It also gives the board president an opportunity to assess members' qualifications. In addition, the first meeting permits the SIB to collectively examine itself for gaps in expertise beyond the standard complement of board members required by AFI 91-204 (see **paragraph 2.4.**). Some of the following members may be required:

5.5.1. **Commander's Representative.** AFI 91-204 provides for a commander's representative to the SIB. The convening authority may provide this option to the commander possessing the aircraft or the commander to whom the crew is assigned if that commander so requests. Commander's representatives are non-primary members (see **paragraph 2.5.2.1.2.**).

5.5.2. **Crew Counterparts.** While AFI 91-204 only requires a pilot member to deal with operations-related issues, consider obtaining crew counterparts (boom operators, flight engineers, etc.) as non-primary members when actions by those crewmembers may be factors in sustaining the mishap sequence.

5.5.3. **Missile, Nuclear, or Explosives Involvement.** If the mishap involves missiles, nuclear components, explosives, or other hazardous materials, an appropriate officer should be added to the investigating SIB structure IAW AFI 91-204.

5.5.4. **Non-DoD Official Observers.** If the Federal Aviation Administration (FAA), other services, or other governmental agencies (federal, state, and local) are directly involved in the mishap, allow them to provide a non-primary representative to the SIB. A similar invitation will be extended to foreign governments directly involved in the mishap as required by NATO Standardization Agreement (STANAG) 3531, bilateral country-to-country agreements on investigative participation, or Status of Forces Agreements (SOFA) when appropriate. Such observers will be representatives of other nations' services. They should not be permitted access to any privileged information or the completed safety report without the approval of the disclosure authorities specified in AFI 91-204 (see **Chapter 9**).

5.5.5. **Life Support Member.** The convening authority normally appoints a life-support officer to the SIB any time the mishap involves aircrew equipment, egress, or survival. This member works directly with and for the medical member of the SIB.

5.5.6. Weather Officer. Appoint qualified weather officers to assist the SIB when weather or weather services were (or may have been) a factor in the mishap. The weather officer should possess expertise in the weather phenomenon suspected of being a cause factor, for example, turbulence, induction icing, warm fog, tropical storms, arctic weather, etc. Once appointed, their duties include providing an analysis of the weather for the analysis section of the report, determining if the crew's weather briefing contained all necessary weather information to the aircrew and whether it was accurate, and preparing weather-specific exhibits for the formal report.

5.5.7. Air Traffic Control Officer. Appoint a qualified controller to assist the SIB when Air Traffic Control (ATC) procedures, navigation aids, communications, or air traffic and landing systems are (or may be) a factor in the mishap. He or she should possess special expertise in the ATC function suspected as cause factor. Once appointed, their duties include review and analysis of ATC training qualifications and experience, collection and review of applicable Standard Operating Procedures (SOP), evaluation of navigational aids, communications equipment, and airfield facilities, and analysis of ATC tapes in conjunction with the pilot member.

5.5.8. Human factors specialist or aviation psychologist. While medical officers receive training in human factors and psychology, they are not specialists in these areas. Furthermore, the medical member is usually time compressed completing his or her SIB duties during the investigation. If human factors, limitations, perceptions, etc. appear to have played a role in the mishap, the SIB will benefit from the inclusion of a human factors specialist and/or aviation psychologist as a member.

5.5.9. Additional Representatives. When required, appoint specially qualified additional non-primary members (i.e. air rescue, system specialist, etc.) for their expertise and objectivity to ensure a thorough and efficient investigation. Request these specialists through MAJCOM channels to the Air Force Safety Center.

5.6. Setting the Board in Motion. The SIB president should formally gather the assigned board members as soon as practical after the mishap. The entire board (or as many members as possible) should receive a hand-off briefing from the ISB president per [Attachment 3](#), paragraph [A3.11.3](#). After the formal hand-off brief the SIB members will then have an opportunity to meet with their ISB counterparts and receive a specialized hand-off brief.

5.6.1. Investigating Officer. The investigating officer, working under the direction of the SIB president, manages the investigation. The quality of the investigation depends on the judgment, hard work, and integrity of the investigating officer and the assigned board.

5.6.1.1. The investigating officer:

5.6.1.1.1. Directs and coordinates the efforts of other investigators, technical experts, and supporting installation personnel within the scope and parameters set forth by the SIB president.

5.6.1.1.2. Works with the HQ AFSC representative to ensure proper investigative procedures are used, and the report is prepared in accordance with AFI 91-204.

5.6.1.1.3. Oversees the making of diagrams, maps, and photographs.

5.6.1.2. To succeed at these diverse tasks, the investigator must not devote too much attention to a single aspect of the investigation. Other members of the board may be experts in their fields, but their expertise generally does not extend to the process of investigating. The investigating officer must blend their separate perspectives into a unified, complete portrayal of the mishap.

5.6.2. Recorder. The recorder is the administrative manager and coordinator of the SIB.

5.6.2.1. The recorder's primary objectives are to:

5.6.2.1.1. Coordinate with the AFSC representative to ensure full administrative and logistical support is provided to the board.

5.6.2.1.2. Manage the work center, controlling access and making it an effective communications focal point for all board activities.

5.6.2.1.3. Supervise all additional administrative assistants assigned to the board.

5.6.2.1.4. Maintain a filing system to account for all evidence, testimony, and board proceedings both electronically and physically to ensure security and prevent loss.

5.6.2.1.5. Assist the board president, investigating officer, and HQ AFSC representative with the compilation, reproduction, assembly, and distribution of the formal report.

5.6.2.1.6. Assist the board president in the preparation of a briefing on the mishap.

5.6.2.1.7. Facilitate a smooth hand-off of factual material and evidence to the AIB.

5.6.2.2. Take into consideration the following priorities, guidelines, and hints to make the administrative task easier. Only minimum requirements are covered here; there is always plenty of opportunity for additional effort and initiative. For a list of desired SIB support see AFI 91-204. Some of the priorities include immediately securing office space, transportation, and billeting for the investigation board:

5.6.2.2.1. Obtain a suitable work area. At a minimum, this means a room with a large conference-style table, an adjacent large room for typing, administration, report assembly, packaging, etc., two small rooms for conducting interviews and an office for the board president. If an appropriate work area is not available at a convenient USAF or other government site (National Guard armory, etc.), secure space from a civilian source. All rooms must be capable of being locked and allow for secure processing of safety privileged information and material.

5.6.2.2.2. SIB members will be billeted in the same area. If possible, get rooms with class A phones installed. Advise billeting or hotel management of possible additional requirements for rooms (new technical assistants or board members, etc.) as soon as practical.

5.6.2.2.3. The SIB president, investigating officer, HQ AFSC representative, medical member and maintenance member should each have their own vehicle due to the diversity of the territory each has to cover. Beyond that, one vehicle for every two SIB members is normally adequate. Obtain additional transportation for technical or medical assistance personnel as required.

5.6.2.2.4. Identify local POCs for office and personal equipment supply requirements, communications and computer support, and transportation assistance with the concurrence of the supporting commander. The SIB requires access to computer support seven days a week.

5.6.2.2.4.1. Ensure the availability of office supplies and other equipment for each SIB member and the clerical staff as soon as possible. Arrange for items such as foul weather clothing through the local safety office or supporting commander.

5.6.2.2.4.2. All class A phones must also have direct access to Federal Telecommunication System (FTS) phone lines. Make sure all phones in all work areas can pick up on all

numbers. Ensure that your assigned telephone FAX line has direct access to DSN/FTS phone lines. Arrange for the installation of 2-3 DSN/FTS phone lines that will be dedicated to computer MODEM operation if not connected directly to a local area network (LAN). If you are connecting the SIB computers to the LAN, ensure that no other personnel, including commanders, have access to those drives or the SIB partition.

5.6.2.2.4.3. If the mishap site's location is somewhat inaccessible, it may be necessary to arrange a regular or on-demand shuttle service with the supporting commander. As you arrange such support, make it clear that you are sensitive to the demands such requests impose on the supporting installation, and work with the board president to obtain release of all such "reserved" transportation assets at the earliest opportunity.

5.6.2.3. Guidelines for Effective Investigation Management:

5.6.2.3.1. Post a sign-out chart somewhere convenient to the main door to the work area; if possible, place it close to wherever your administrative personnel work. Ensure each SIB member fills in his or her departure time, estimated return time, destination, and remarks. Rotate your administrative support staff to ensure constant manning of phone lines during SIB working hours. This duty area should ideally be located where visitors to the SIB may be greeted and provided information, and to validate their access to the deliberation areas.

5.6.2.3.2. In coordination with the investigating officer, the AFSC representative should post a progress log of some type in the SIB meeting/conference room. An example is shown in [Chapter 8](#). The basic information may be amplified with an expanded administrative log that indicates the tabs, responsible individual, date to typist, draft complete, tab complete, and comments.

5.6.2.3.3. Post a calendar, with the planned timeline, in the SIB meeting/conference room. The desk blotter size is usually best for this purpose. This will provide the SIB with an updated administrative progress report at the start and/or end day meetings. Tactfully highlighting problematic compliance on either the timeline or progress log will usually provide for a quick fix. Furthermore, these displays will ensure SIB OPRs are assigned to each task, avoiding duplication of efforts and maximizing your SIB's effectiveness. While conducting your safety investigation, time will invariably prove to be the most precious commodity. You and all other SIB members must use it judiciously.

5.6.2.3.4. Start a filing system as soon as possible. See [Chapter 8](#) for specifics; consider the following minimum steps:

5.6.2.3.4.1. Set up a filing system and a master index. Clearly label each folder as to what it contains and transfer the title and folder number to the index page. Create a new file/folder when new items come in requiring one. Place a set of (A through Z minus those tabs not used, normally E and F) folders in another drawer for drafts of each tab. Consider assembling a second set of tab folders in a separate drawer to store completed tabs, including original documents (crew orders, flight plans, etc.). Keep draft and final typed sections in their respective folders.

5.6.2.3.4.2. Establish separate folders for each message transmitted and received by the ISB and SIB; label them by originator, date/time group, and subject, e.g., "HQ ACC/SEF 181355Z DEC XX, "Request for Technical Expert". Ensure the original message computer disks are kept with a copy of the transmitted messages.

5.6.2.3.4.3. Create at least two folders for each board member -- one as a “working” folder, and one the typists should use to get typed products and transcripts back to the appropriate person.

5.6.2.3.4.4. Create at least one clearly labeled folder for each of the following items (many of which may have already been collected by the ISB):

5.6.2.3.4.4.1. ATC tapes or transcripts involving the mishap flight.

5.6.2.3.4.4.2. Telemetry tapes and data.

5.6.2.3.4.4.3. Diagrams of the mishap area.

5.6.2.3.4.4.4. Photographs of the mishap area.

5.6.2.3.4.4.5. Public releases that the PAO may have made prior to the arrival of the SIB. (Ensure the PAO clearly understands that all future releases are to be coordinated with the AIB president via the SIB.) See [4.11.](#)

5.6.2.3.4.5. Create a witness log. List all witnesses who contact the SIB. Differentiate between those that were interviewed and those that were not. List their home and work telephone numbers and where they are employed. This list will be given to the AIB during the handover.

5.6.2.3.4.6. Create an inventory of items that will be handed over to the AIB. Include aircraft wreckage and its disposition, Part I of the formal report, photographs, maps, witness lists, original records, results of AFIP reports, autopsies, and any other non-privileged information. Both the SIB and AIB Board Presidents should endorse this inventory and a copy kept by the SIB president to show the physical transfer of evidence. If the AIB President has not arrived on scene by the time the SIB is finished, this inventory and the evidence will be signed and accepted by the local Judge Advocate awaiting the AIB President's arrival.

5.6.2.3.5. Contact the mishap crew's Military Personnel Flight's personnel systems management division; provide them a written request for a comprehensive printout of personnel data available on aircrew victims. (This information is purged from the personnel system 10 days after a fatality.)

5.6.2.3.6. Contact the convening MAJCOM's safety office to ensure board orders are issued. Upon receipt, set them aside for inclusion in the formal report as Tab Q.

5.6.2.4. Hints:

5.6.2.4.1. From the moment the investigation starts, record every telephone number used by the board and create a “living phone book” of them, updated as frequently as possible. Post frequently called numbers beside each phone for easy reference. Include all SIB telephone numbers, cell phone numbers, pager numbers, Fax machine numbers, DSN access, any long distance calling procedures, SIB members rooms, billeting, and the SIB mailing address.

5.6.2.4.2. Keep a log of all personnel who worked on the board. Ensure you have full names, ranks, titles, organizations represented, home and work addresses, telephone numbers, e-mail addresses and cell phone or pager numbers. Keep a similar log of anyone who helped the SIB. In all cases, acquire the name, rank and office symbol of the person's supervisor. The Board

President may want to issue thank you letters and it is much easier to get the information along the way than to try to track it down the last few days.

5.6.2.4.3. Make sure board members keep a record of all commercial long distance calls they make, preferably at the same time they place their calls. Complete an AF Form 1072, **Authorized Long Distance Telephone Calls**, to consolidate individual calling records for accounting purposes.

5.6.2.4.4. Don't skimp on work space! What's acceptable early on in the investigation is easily outgrown. Completed report tabs, evidence, partially reproduced copies of the report, briefing materials, and other items require plenty of sorting, organizing, and storage space; it pays to arrange for it up front.

5.6.2.5. Special Considerations Regarding Report Production and Typing:

5.6.2.5.1. The need for clerical assistance at the beginning of the investigation is normally light. Once the report begins to take shape, the SIB may need two or three full-time typists.

5.6.2.5.2. Prepare a list of priorities in the beginning to keep the typists from being deluged with disorganized work requests. Ensure all typists use the same font and pitch and standard format. See **paragraph 8.6.1.** and AFI 91-204.

5.6.2.5.3. Manage the paperwork to keep a smooth flow. Ensure the typists type "President," "Investigator," "Pilot," "Maintenance," "Medical," and "Recorder" on the last sheet of double-spaced typed drafts so each can initial after reading for content, grammar, and spelling errors. For final copies, have the typist type the titles on a small 2- by 3-inch sheet of paper and clip it to the final typed sections. Tell SIB members to place paper clips horizontally on the right edge of the paper opposite the lines in which they discover errors. This draws the typist's attention to the page and line that requires correction without marking on the original.

5.6.2.5.4. Transcribing testimony is by far the most labor-intensive and time-consuming administrative task to be coordinated by a recorder. Boards tend to want paper copies of virtually every interview. Get as early a start on transcription as possible, but ensure the transcripts are prioritized by the board and are at least tentatively identified as necessary by the SIB president, AFSC representative and/or investigating officer.

5.6.2.5.5. Assign one person to be responsible for completing transcripts, assuring that they are formatted consistently and completing Tab U for the investigating officer's and AFSC representative's review.

5.6.2.5.6. Have board members periodically review and correct technical terms or slang as necessary, and enter such terms in word processing spell-checkers whenever possible.

5.6.2.5.7. Have the person that conducted the interview perform the initial review of the transcript. Usually, transcripts must be proofed three times before they are reasonably accurate.

5.6.2.5.8. Don't wait until the last minute to start copying the board's report. Some tabs can be built, copied, and set aside literally the first week of the investigation. Preplanning and advance copying can also greatly reduce the burden on the base reproduction staff, which will become critical to success during the endgame of report publication.

5.6.2.5.9. Original documents of any report or record are required. Those going into part one of the final report are placed in the copy of part one given to the AIB. Documents that are

manipulated to fit within the report can be given to the AIB separately. Original documents that go into part two of the report are placed in copy # one (1), which is sent to the Office of the Staff Judge Advocate, Air Force Safety Center (AFSC/JA). Any documents altered to fit into the report format will be included in plastic sleeves directly behind the reproduced version.

5.6.2.5.10. The last-minute rule also applies to photographic support. Decide early enough which photographs are needed for the report so the photo lab doesn't panic. The more time they have, the better product they produce. The same thing applies to any visual/audio graphic visual aid request(s) your SIB might envisage. Animation is time consuming and is not always necessary. Decide as soon as possible if animation will be required for the briefing and have the AFSC representative find out where it will be made, when the animation lab is available, and who is required to assist the animator. If there is not an AFSC representative on the board coordinate with AFSC/SEFE MAAF division (DSN246-3746).

5.6.3. Air Force Safety Representative. The AFSC representative to the board plays a number of key roles in helping the board president get the investigation underway.

5.6.3.1. As an *investigation process expert*, the safety representative is available to give "refresher training" in board procedures, individual board member responsibilities, and the investigation timeline.

5.6.3.2. As an *investigative techniques expert*, the safety representative is a skilled, experienced member of the board whose additional training can augment the efforts of all board members, and who can help guide the board's analysis efforts (see [Section 5E](#) below).

5.6.3.3. As an *investigative resources expert*, the safety representative has ready access to any kind of specialized technical assistance which may be needed by the board, and can advise the board president on the most suitable types of assistance and the most reliable sources of outside help available.

5.6.3.4. As noted in [Chapter 2](#) the AFSC representatives specific duties include:

5.6.3.4.1. Leading the findings and recommendations phase/sessions of the investigation by first educating SIB members on the process and then guiding the SIB through the development of factors, findings, causal findings, and recommendations as well as Other Findings and Recommendations of Significance.

5.6.3.4.2. Ensuring that the formal report is complete, consistent, and in compliance with AFI 91-204, particularly with regard to protecting privilege. The SIB recorder will rely upon the AFSC representative for direction in virtually all aspects of his or her position.

5.6.3.4.3. Acting as the SIB's conduit for requesting technical assistance or manufacturer/contractor participation.

5.6.3.5. As noted in [Chapter 2](#) and [Figure 2.1.](#), the AFSC representative works directly for the board president. AFSC representatives should not be placed in charge of any single investigator or investigative group; their skills are best employed when they are free to circulate among all of the other board members. However, this autonomy does not preclude their assignment to specific investigative tasks on a temporary basis (interviewing witnesses, assisting with site surveying or photography, etc.).

Section 5D—On-Scene and Work Center Activities

5.7. Getting Started. Through well meaning but disjointed efforts, it is possible to destroy or overlook evidence rather than uncover it. It is extremely important to begin with a plan and follow it through to completion, altering, of course, as dictated by changing situations. Obviously, each mishap requires a slightly different approach, depending on circumstances, location, and other unpredictable factors. To ensure success, it is essential to have a working strategy going into the investigation. For that reason, it is strongly recommended that board members plan their first trip to the site, rather than simply heading out and sightseeing in the guise of “familiarizing oneself with the scene.”

5.7.1. Ensure everyone knows where the investigative equipment described in [Attachment 2](#) is located, and that they know how to use it properly (especially personal protective equipment, if required).

5.7.2. Obtain “hand-off” information (see [Attachment 3](#), paragraph [A3.11.3.](#)) from the ISB so all members understand the conditions they are likely to encounter.

5.7.3. Review priorities, procedures, and precautions for collection and protection of perishable evidence:

5.7.3.1. Human remains and toxicological samples from survivors and potentially relevant ground crew, etc.

5.7.3.2. Fluid samples of engine oil, fuel, and hydraulic fluid (flammable and toxic).

5.7.3.3. Gas samples (flammable)

5.7.3.4. Flight data recorders (FDR or DFDR/CSFDR) [confirm power has been removed]

5.7.3.5. Cockpit voice recorder(s) (CVR)

5.7.3.6. HUD Videotape Recording (VTR). VTRs often appear badly damaged yet yield tapes that can be cleaned up and replayed. The AFSC representative will find out where to send damaged tapes for repair and recovery.

5.7.3.7. Air Traffic Control tapes. Tapes from Tower or Center may be required. Request them immediately since some systems write over tapes if they are not pulled soon enough. Many ATC facilities are trained to provide certified transcripts of requested tapes.

5.7.3.8. Air Combat Maneuvering Range or Instrumentation (ACMR or ACMI) tapes.

5.7.3.9. Radar recreations of mishap aircraft are normally available in the CONUS from USAF Radar Evaluation Squadrons. This information must be requested. Call the AFSC Technical Assistance Hotline 24 hrs/7 days a week at DSN 246-5867, commercial: 505-846-5867.

5.7.3.10. Photographs. Don't move anything until it has been photographed where it rests. If weather threatens to change significantly within 24 hours set a high priority on comprehensive photo coverage of the entire scene.

5.7.3.11. Site Survey. An official CE survey should always be conducted for Class A mishaps involving widespread wreckage. If the crash scene includes a long ground scar and/or widespread scattering of components, do not move components any significant distance from where they rest without first taking pictures, then placing an appropriately labeled stake in their stead. This will permit completion of a crash site survey at a later time.

5.8. Initial Actions at the Scene:

5.8.1. Familiarization Walk-through. Prior to the first trip to the mishap site, answer this question: “Is the scene safe for the investigators?” Do any components present a hazard to investigators or surrounding personnel or structures? Develop a general plan of organization and proceed to the mishap scene. Board members should make an initial walk-through of the wreckage or visual inspection of damage. It is helpful for the ISB members to accompany the SIB members on the initial walk-through.

5.8.1.1. A photographer should accompany the SIB members; if none is available, both the investigating officer and AFSC representative should be prepared to take pictures as required.

5.8.1.2. If available, include a highly experienced maintenance specialist and/or assigned technical experts in the walk-through. Past experience has proven their expertise extremely valuable. In the event of serious injuries or crew fatalities, the medical officer should also take part in the walk-through.

5.8.1.3. Take photographs before moving any portions of the wreckage.

5.8.1.4. If the crash occurred within the confines of a military facility or civilian airfield, verify with the operator on the possible availability of a video record of the mishap through their site security, tower, or weapons ranging cameras. A surveillance camera for the flight line can hold vital images for your analysis and possibly the whole mishap sequence. The ISB should have saved these tapes since these types of video systems will normally re-record over their videotapes after a fixed period of time.

5.8.2. Site Assessment. Once initial wreckage orientation is complete, the board must develop a working knowledge of the entire scene. Assign specific on-scene assessment responsibilities to individual SIB members and assigned SIB investigating experts. Special attention should be given to understanding how the configuration and condition of the wreckage may have been altered during initial response, survivor recovery, or other operations in its immediate vicinity. Interview fire fighting and rescue personnel in these cases to determine which parts of the wreckage they moved or otherwise came into contact with. General questions to be answered are:

5.8.2.1. Is it safe for the investigators? Do any components present a hazard to investigators or surrounding personnel or structures?

5.8.2.2. Was the impact high or low speed?

5.8.2.3. Was the impact at a shallow or a steep angle?

5.8.2.4. Where is the first apparent point of contact between the aircraft and the ground or a ground-based feature (structure, trees, etc.)?

5.8.2.5. Is the entire aircraft present? Are any major components missing?

5.8.2.6. What systems and subsystems are reasonably intact? What components may require extended time in the field and protection from the elements for meaningful analysis?

5.8.2.7. Are there indications that the engine/engines were operating at the time of impact?

5.8.2.8. Are there any immediately obvious indications of pre-impact fire (e.g., areas of “flowing metal,” “feathered edges,” scorching on interior components not apparently involved in post-crash fire, etc.)?

5.8.3. Site Preservation. The ISB and SIB must ensure the site is stabilized to prevent loss of evidence. However, there may be compelling reasons to remove some crucial evidence from the scene quickly.

5.8.3.1. Disposition of Human Remains. Ideally, human remains (as opposed to survivors) should be left in place until a trained investigator can document their locations, condition, etc. However, for humanitarian, jurisdictional, and practical reasons, there is usually pressure to remove human remains from a scene promptly, so the ISB and/or recovery/rescue personnel may not wait until the full SIB has assembled. Further, in some climates, it could be essential to the health and safety of those working in the vicinity of the wreckage to remove remains rapidly. The following steps should be conducted by or under the supervision of the ISB or SIB's medical member:

5.8.3.1.1. Before moving any human remains, jurisdiction for those remains must be clarified. In most cases, the local coroner/medical examiner will have jurisdiction (legal control) over the remains. Ideally, jurisdiction issues for geographic areas surrounding military installations and ranges should be delineated ahead of time during mishap response planning. Most FAA Regional Medical Examiners maintain a database delineating the areas of jurisdiction and may be of assistance in clarifying these issues.

5.8.3.1.2. Proper personal protective equipment (PPE) must be worn to protect against blood-borne pathogens, composite materials and other potentially hazardous aerospace materials. The extent of PPE should be determined by the medical member with appropriate consultation, as needed, by a bioenvironmental engineer.

5.8.3.1.3. Before moving any human remains, the medical member is responsible for detailed site diagramming coordinated with specific clearly labeled stakes and photographs showing pertinent detail.

5.8.3.1.4. Because personal life support and escape equipment is intimate with the remains, carefully photograph and examine these items if their removal is required.

5.8.3.1.5. Remove human remains only after completely documenting and closely scrutinizing all surfaces of remains with on-scene photography. Ensure photographs include adjacent structures which could account for traumatic injuries or objects which show evidence of tissue transfer.

5.8.3.1.6. The gross position, posture, and condition of crash victims are valuable evidence. Questions often can be resolved with photographic evidence of the location of human remains, e.g., the location of crew members in relation to the cockpit can help determine who occupied each crew position. In the case of multi-pilot aircraft without cockpit voice recorders, it is often difficult to determine who was flying the aircraft without such information.

5.8.3.2. Disposition of Wreckage. It may be necessary to move some or all of the wreckage expeditiously from locations such as highways, runways, or populated areas.

5.8.3.2.1. In all such cases, obtain immediate aerial photography with as much close-in coverage as possible before the wreckage is removed. These photographs may be the only documentation of the actual condition of the accident scene and collateral damage, and as such could represent important evidence down the road for claims against the government or in other litigation.

5.8.3.2.2. It may also be useful to construct a wreckage diagram, which may be as simple or complicated as the situation dictates.

5.8.3.2.2.1. For mishaps in which structural integrity is in question, or where the crash pattern weighs heavily on possible causes of either the mishap or crash-related injuries, the diagram requires more detail to substantiate the findings.

5.8.3.2.2.2. If diagrams are necessary simply for orientation purposes, all that is needed is to show the relationship of the aircraft to the surrounding terrain. Include topographic or structural features if their positions have a strong relationship to the mishap.

5.8.3.2.2.3. When the mishap occurs on non-government property, a detailed diagram is required to capture where aircraft pieces impacted private property and is useful for displaying the boundaries of scorching and debris scatter.

5.8.4. Pilot Member Priorities:

5.8.4.1. Determine, record, and photograph cockpit switch and circuit breaker positions, and instrument indications.

5.8.4.2. Identify, photograph, and tag significant parts, especially cockpit control, warning and caution displays, and instrument panels.

5.8.4.3. Take notes--don't trust important facts to memory.

5.8.4.4. Consult [Attachment 4](#) for detailed information.

5.8.5. Maintenance Member Priorities:

5.8.5.1. Ensure that a constant evidence custody chain is maintained for all physical portions of the mishap weapon system.

5.8.5.2. Record, mark, and photograph hydraulic actuator positions and flight control positions (including trim tabs).

5.8.5.3. Obtain samples (fuel, oil, hydraulic, oxygen) from mishap aircraft and servicing aerospace ground equipment, and mark (indelibly) them with the source of the sample (Engine #2, Tail #XXX, etc.).

5.8.5.4. In coordination with pilot member and technical expert(s), record and photograph cockpit switch and circuit breaker positions and instrument indications (ensure no one changed them before SIB review).

5.8.5.5. Identify, photograph, and tag significant parts (use indelible ink since it may rain at the most inopportune times).

5.8.5.6. Protect essential parts from the elements.

5.8.5.7. Direct removal, re-assembly, teardown deficiency report (TDR), etc., of suspected components upon completion of photographic documentation.

5.8.5.8. Take notes--don't trust important facts to memory.

5.8.5.9. If required, have the Board President request crew chiefs/maintainers for the type of mishap airframe to assist in locating/identifying specific aircraft parts.

5.8.5.10. Consult [Attachment 4](#) for detailed information.

5.9. Establishing a Working Routine:

5.9.1. Daily Activity. The typical SIB (if there is such a thing) spends the first 1 to 2 weeks digging through wreckage, interviewing witnesses, analyzing records, etc. Because individual board members each have responsibilities that may require them to work independently for hours or days at a time, it is extremely important to have regular, scheduled meetings to keep each SIB member updated on the latest findings and any new avenues of inquiry, which may develop. Consider the following as an initial strategy for developing a working routine, bearing in mind that every board has different needs and priorities:

5.9.1.1. As a minimum, conduct a daily SIB meeting to debrief individual progress and determine what is known and unknown; use a blackboard, overhead projector, computer-generated presentation, butcher paper, or just a typewritten agenda to keep the discussion on track. (Many boards find it easiest to schedule this meeting at the end of the day, sometimes after dinner, to make the scheduling of daytime activities simpler.) Ensure those in attendance brief only what they found out and what they need rather than what they did. This will prevent the meetings from dragging on and will help keep the board focused as the investigation nears the end.

5.9.1.2. Establish specific tasks, priorities, schedules, and support required for the next day.

5.9.1.3. Agree on any new requirements for technical assistance. The AFSC representative will arrange technical assistance as necessary.

5.9.1.4. Prepare, coordinate, and transmit supplementary reports or recommendations for interim action as necessary.

5.9.1.5. Determine areas of special interest so SIB members can be alert for evidence in these areas; adjust interview guides and individual member checklists as necessary (see [Attachment 4](#), [Attachment 5](#) and [Attachment 6](#) as appropriate).

5.9.1.6. Review progress on specific tasks and formal report tabs (see [Chapter 8](#)).

5.9.2. Interview Scheduling:

5.9.2.1. Interviews should be scheduled as soon as possible after the mishap. See [Attachment 5](#) for preparation and conduct techniques.

5.9.2.2. The commander of the personnel involved ensures the crew and all military participants are made available to the board for the investigation. As it is determined that the individual will not be needed by the SIB, the board president then releases them to the AIB president.

5.9.2.2.1. The SIB president advises the commander when mishap participants are no longer needed for interviews. He/she may also provide the convening authority with factual information that may influence the commander's decision whether or not mishap participants may resume their duties. The SIB does not decide whether the mishap participants should return to duty. That is the sole decision of the mishap participants' commander.

5.9.2.2.2. Any decision to take adverse actions must be made by the convening authority independent of safety board findings.

5.9.3. Work Center Staffing. The work center is the hub of board activity. Even though much of a board's attention may be directed toward the crash scene in the early days of an investigation, the work center becomes its "home away from home" as long as it is convened. The recorder's primary

function, once initial logistical arrangements have been made, becomes the upkeep of the work center. This means:

- 5.9.3.1. Ensuring the phones are always answered and messages reach their intended recipient.
- 5.9.3.2. Keeping ahead of filing, reproduction, and transcription requirements.
- 5.9.3.3. Helping keep physical evidence organized and secure.
- 5.9.3.4. Keeping “tourists” away from the board.

Section 5E—Analyzing the Data and Writing the Report

5.10. Getting Down to Business.

5.10.1. The real work of an investigation can be summarized as follows:

- 5.10.1.1. Evidence collection.
- 5.10.1.2. Evidence interpretation.
- 5.10.1.3. Theory formulation and testing.
- 5.10.1.4. Development and presentation of conclusions.

5.10.1.5. However, a number of pitfalls attend the above easy-to-list steps. This section is designed to provide food for thought and jumping-off ideas for the kind of brainstorming that most boards must eventually make use of. The last bullet -- development and presentation of conclusions -- is treated in general terms in [Section 5F](#) and in greater detail in [Chapter 8](#).

5.10.2. The Search for Evidence. Mishaps almost never occur from a single causal factor. Even when mishap personnel are found to be causal, additional factors almost always have come into play. These factors may include system malfunction, maintenance malpractice, training, directives, supervision, or other events that compounded the crew’s problems at a critical point in flight. Don’t rule out any possibilities before exhausting all available investigative avenues, and make sure you have solid reasons for rejecting each mishap scenario that suggests itself before moving on.

5.10.3. Deciding What the Evidence Tells You. There are a finite number of reasons why any aircraft ends up in a mishap. Simply put, these are:

- 5.10.3.1. An imbalance, or deficiency in lift, thrust, weight, and/or drag.
- 5.10.3.2. A structural failure that prevents the aircraft from maintaining lift or directional control.
- 5.10.3.3. Climatic conditions inconsistent with flight.
- 5.10.3.4. Inappropriate configuration.
- 5.10.3.5. Inappropriate application of controls.

5.10.4. Virtually all mishaps can be attributed to one or more of these conditions. “Human factors” errors, for example, could lead to any of these outcomes, such as: improper cargo loading, undetected damage to a load-bearing member, poor route selection, failure to extend flaps, or spatial disorientation. The board’s challenge is to work from the known to the unknown, using the results as a starting point, assessing how a vehicle designed for safe flight came to rest in the observed condition and then extrapolating various possibilities from there.

5.11. Specific Considerations for Detailed Analyses. Consider the following in conjunction with the detailed checklists for information-gathering contained in [Attachment 4](#).

5.11.1. Operational Analysis. Reconstruction of the events and circumstances that led to the mishap is frequently the only way to make sense of inconclusive physical evidence. Flight simulators are an excellent means of reconstructing the sequence of events. In cases where the desired conditions cannot be adequately simulated, an actual aircraft may be needed to recreate a potentially mishap-producing situation. Should the board deem this necessary, duplicate all known factors as accurately as possible, including airspeed, altitude, weather, sunlight or shadow display, and other details important to the event. **WARNING:** A perfect recreation of the conditions under which your mishap occurred could easily result in another mishap! Before any recreation flight is conducted, carry out a risk analysis for the flight and have the board president advise the convening authority of the board's intentions.

5.11.2. Maintenance Analysis. The need for the maintenance member's active participation in every investigation cannot be overstated. Maintenance members have the daunting task of completely recreating aircraft maintenance and servicing records, and for helping to inventory the wreckage itself. However, a thorough mishap investigation must always consider the problem of determining exactly where the mishap sequence started. Some apparent materiel failures may be traceable to acquisition decisions or known, accepted risks, while others could stem from improperly performed repairs, overhaul, or servicing. Once it is possible to focus on specific failed components, the investigation may need to explore depot or local maintenance management, technical training, or other areas. Therefore, maintenance members should consider dividing their analytical efforts (with appropriate support as necessary) into separate categories as follows:

5.11.2.1. Examination of aircraft components:

5.11.2.1.1. Components of today's airborne weapon systems are complex. As a general rule, post crash analysis requires technical expertise far beyond that of the primary board members. Technical experts, and/or specialized investigative facilities or laboratories are ideal for such examinations. Chances are good that there are people in a maintenance organization, at a contractor, or at a supporting installation, that are a phone call request away from providing you with the assistance of the best-qualified personnel. The AFSC representative will handle locating and formally requesting assistance. The AFSC representative will keep you out of contractual obligations as well as conflicts of interest.

5.11.2.1.2. Don't overlook local field training detachments as a source of assistance; they can be very helpful with mock-ups of systems and cutaway parts, and their instructors tend to be very sharp on both theory and specific hardware.

5.11.2.1.3. Examination of the "paper trail." This is a time-consuming job best done by someone who regularly reviews, audits, or inspects maintenance records such as Quality Assurance (QA):

5.11.2.1.3.1. Compile a list of deficiency reports; determine if any of these areas may have contributed to the mishap.

5.11.2.1.3.2. List all technical order non-compliance against the aircraft, and determine if noncompliance may be contributory.

5.11.2.1.3.3. Survey aircraft discrepancies on previous flights, or since the aircraft departed home station, for corrective action and possible evidence of contributory factors.

5.11.2.1.3.4. Ensure deficiency reports are prepared on failed parts and AFTO Form 22, **Technical Order Improvement Report and Reply**, are submitted on deficient technical data (procedures, illustrations, etc.).

5.11.2.2. Examination of hands-on maintenance activities, including:

5.11.2.2.1. Local and depot maintenance standards and procedures.

5.11.2.2.2. Local and depot quality assurance.

5.11.2.2.3. Local and depot equipment and facilities.

5.11.2.2.4. Local and depot personnel and training.

5.11.3. System and Subsystem Analysis. In determining if a system did or did not malfunction, it may be necessary to make certain assumptions and then follow a logical course of reasoning in a fault-type analysis. For example, if a system consists of three component parts (A, B, C), model possible failures and their predictable consequences. "What happens to B and C if A fails? What happens if B Fails, but not A or C?" It may be necessary to presume a malfunction did occur in each aircraft system and then attempt to disprove that presumption through system analysis. The fact that a system was working may be as important as the fact that it was not. These "negative deficiency" technical reports have value and must be included. Use the following to assist in such an analysis:

5.11.3.1. Look at each component and system for indicators of condition, position, or movement.

5.11.3.2. Check maintenance records and logs. They are the best source of evidence of chronic conditions or recent troubles. Look for reasons of past complaints or previous corrections.

5.11.3.3. Look for evidence of "usual" malfunctions. Almost every part or system has a history of repeated or predictable failures. Requesting a computer search for failure history can also provide valuable help (see "Safety History Analysis" below).

5.11.3.4. Look for missing components, incorrect parts, or incorrect installation.

5.11.3.5. Look for too many parts, foreign objects, or evidence of FOD.

5.11.3.6. Determine if the part, component, or system was operational.

5.11.3.7. Observe the color, shape, smell, location, position, or appearance for potential clues of proper operation or possible malfunction. When possible, make a visual comparison with a part of known quality or function.

5.11.4. Fire Pattern Analysis. Investigators will usually encounter some burned or melted components in the course of a typical crash scene investigation. The challenge is usually to determine if the fire was simply the result of the crash, or if it began and propagated in flight.

5.11.4.1. Limitations of On-Scene Examination. Characteristic damage from fire can frequently be assessed on the spot by fire pattern investigators. However, some information, such as maximum temperatures experienced in conjunction with a fire, must be determined through specialized metallurgical examination. Some metals will only melt in the presence of extremely high temperatures; such extreme heat usually can be attained only through the "fanning" and "chimney" effects encountered aboard an aircraft in flight.

5.11.4.2. Clues to Distinguishing Pre-Impact from Post-Impact Fire:

5.11.4.2.1. Look at components with soot on them:

5.11.4.2.1.1. If the soot is of varying density and is randomly distributed, it probably was the result of post-crash fire; soot with a striated (striped) pattern, or which appears to “flow” from the direction of flight, probably occurred in flight.

5.11.4.2.1.2. If the soot-covered area is not a smooth surface, look for gouges or scratches; surface damage which mars an otherwise uniform layer of soot may indicate a component that was subjected first to fire, then impact, while such features which are overlaid with soot probably were first damaged in the crash, then subjected to fire.

5.11.4.2.2. Look at torn and ripped metal components: if their edges are clean, but adjacent surfaces are soot-covered, they may have been damaged by fire in flight.

5.11.4.2.3. Look at melted components:

5.11.4.2.3.1. If they show definite “flowing” or signs of progressively increasing melting when oriented in the direction of flight, they may have been subjected to intense heat in flight.

5.11.4.2.3.2. If they are splattered with molten material or less damaged on the side next to the ground, they were probably damaged during a post-crash fire.

5.11.4.2.4. Look at crushed components; if you can smooth them out to look at the surfaces that were on the inside and find soot, it probably got there before they were crushed.

5.11.4.2.5. Look at components that wound up clear of the main area of post-crash fire:

5.11.4.2.5.1. If they show signs of fire damage, but are not in the immediate vicinity of the main body of the wreckage, they may have been subjected to fire in flight; however,

5.11.4.2.5.2. For large-frame aircraft, the opening of wing or body fuel tanks during a crash sequence can cause aerosolizing or massive displacement of fuel in the general direction the aircraft was traveling at impact, which can result in the center fuselage/wing box area being substantially unburned. At the same time, other massive structures (tail empennage, etc.) may be carried past the center fuselage by their own momentum and wind up being subjected to post-crash fire damage.

5.11.5. Human Factors Analysis.

5.11.5.1. Ensure all of the following are explored (**Note:** This list may not be all encompassing. There may be other human factors to consider depending on the mishap, see [Attachment 8](#)):

5.11.5.1.1. Supervisory concerns (command and control, discipline enforcement, supervisory model behavior, and expressed pressure in tasking the aircrew).

5.11.5.1.2. Institutional concerns (selection, evaluation, promotion, workload and additional duties, conditions of the local or military lifestyle, and internalization of unit or organizational values).

5.11.5.1.3. Communication concerns (within the cockpit, between personalities, outside the cockpit, communications, and equipment failure).

5.11.5.1.4. Peer influence (verbal comments, commonly held beliefs based on unspoken or unwritten learning, and perceptions of equipment concerns).

5.11.5.1.5. Cockpit design.

5.11.5.1.6. Access to adequate quarters, facilities, and services.

5.11.5.1.7. Nutrition, exercise, medical and psychological history, recreation habits and use of medications, herbal preparations and nutritional supplements.

5.11.5.1.8. Aviation facilities (airfield lighting, condition, and services, air traffic control service, etc.).

5.11.5.1.9. Mission planning and briefing.

5.11.5.1.10. Special stresses associated with the mishap crew's mission (schedule, nature, visibility, and urgency of mission, etc.).

5.11.5.1.11. Environmental factors (time of day, weather conditions, etc.).

5.11.5.1.12. Emergency actions required and taken.

5.11.5.1.13. Quality and availability of technical data.

5.11.5.1.14. Special problems identified with the mishap aircraft (both the mission design series and the actual tail number involved, e.g. history of false warning lights, prior reports of unidentifiable fumes, etc.).

5.11.5.1.15. Life support/egress/survival equipment functioning

5.11.5.2. The medical member's checklists in [Attachment 4](#) are well suited to information gathering in each of these areas. Additional information is provided following forensic analysis of life support equipment by the Life Sciences Equipment Laboratory at Brooks AFB and of human remains by AFIP.

5.11.6. Weather Analysis:

5.11.6.1. Information-Gathering. ISBs normally secure weather information during the first few hours after the mishap. Local Air Force weather procedures normally call for a special surface observation to be taken immediately upon notification of a mishap; this may also include a special radar observation. When a mishap occurs in a remote area not served by a USAF weather detachment, contact the local flight service station or host nation meteorological service. Outside the CONUS, it may be necessary to rely on weather information available through the airport nearest the mishap scene. In such cases it may be necessary to reconstruct the weather at the time of the mishap based on observations taken in the area near the scene or from the consensus of witnesses. Make every effort to obtain a copy of the weather briefing provided to the mishap crew.

5.11.6.2. Reporting Weather Conditions. Use the AF Form 711B, item 16, Meteorological Conditions ([Figure 8.8](#)). Give the most accurate, verifiable information on the weather existing at the onset of the mishap sequence as possible. If the scene of the mishap is within the observation range of a weather reporting station, use its records; otherwise, it is better to obtain a consensus from witnesses. If a consensus is not available, estimate existing conditions from the closest weather reporting station. Make all entries in a standard time from the Hourly Sequence Report (Airways Code).

5.11.6.2.1. Sky Conditions. Give as clear, scattered clouds, multiple cloud layers, opacity, etc. State ceiling in feet.

5.11.6.2.2. Visibility. Record visibility in statute miles, and if there were restrictions, show cause. If local reporting is in kilometers or meters, include that figure in parentheses.

5.11.6.2.3. Wind Direction and Velocity. Record the direction by the 16-point compass, and give the velocity in knots.

5.11.6.2.4. Temperature. Record in degrees Fahrenheit. If local reporting is in degrees Centigrade, include that figure in parentheses.

5.11.6.2.5. Dew Point. Record in degrees Fahrenheit. If local reporting is in degrees Centigrade, include that figure in parentheses.

5.11.6.2.6. Altimeter Setting. Record in inches of mercury. If local reporting is in millibars, include that figure in parentheses.

5.11.6.2.7. Other Weather Conditions. Record any pertinent entries normally covered in the remarks section of the Airways Code.

5.11.6.3. Assessing Weather Involvement in the Mishap Sequence. Place a detailed discussion and analysis of unusual weather phenomena in Tab T. When weather is a factor in the mishap, the analysis section of the report should mention what the weather was and how it affected the sequence of events. Analysis of these factors may require one sentence or several pages. For example, a suspected wind shear during a final approach which results in an aircraft landing short requires considerable meteorological skill to determine whether a shear actually existed. Prepare or acquire charts, maps, and other exhibits as needed to support the analysis. There are two primary areas where weather affects the mission:

5.11.6.3.1. The weather services provided to the mishap crew before and during the flight.

5.11.6.3.2. The actual weather phenomenon encountered.

5.11.7. Safety History Analysis. The AFSC representative performs comprehensive historical research throughout the course of the investigation. This research is generally directed at the institutional history of specific safety issues, which may have come into play during the mishap sequence, as well as the overall history of the involved weapon system, the unit, and the mishap participants. Specific areas of inquiry may include, but are not limited to:

5.11.7.1. Mishap history (aircraft, unit, individual).

5.11.7.2. Prior experience with similar mishap sequences (all classes of mishaps).

5.11.7.3. Prior actions taken or deferred with respect to specific weapon systems or components (including information recorded in Materiel Safety Task Group proceedings, the Air Force Safety Center's mishap data and mishap recommendations databases, etc.)

5.12. Strategies for Managing Safety Investigations:

5.12.1. Stick to the fundamentals of investigating. Concentrate on thorough collection of all available information, systematic evaluation, retention, or rejection of possible mishap scenarios.

5.12.2. Avoid contact with mishap personnel, except in formal investigative settings.

- 5.12.2.1. In some cases it is helpful for the board president to meet with a mishap crew and/or other members of the mishap squadron to explain how the investigation process works.
- 5.12.2.2. Specific information regarding the investigation in progress must not be presented during informational briefings to participants, colleagues, or other potential witnesses.
- 5.12.3. Stay away from memorial ceremonies or services.
- 5.12.4. It is the AIB president's duty to deal with surviving family members. SIB members should have no contact with surviving family members. Exception: the SIB president, medical member, assigned human factors rep and/or aviation psychologist may interview the mishap victims' family.
- 5.12.5. Designate one member of the board to keep track of media coverage; have that individual periodically present a brief synopsis. All board contacts with the media should be made exclusively by an experienced USAF public affairs officer.
- 5.12.6. DO NOT TALK TO THE PRESS! Let Public Affairs personnel and the AIB President handle the media. See [4.11.](#)
- 5.12.7. As a minimum, plan for at least a half-day off each week.

Section 5F—Preparing the Briefing

5.13. Philosophy of the Outbrief. From the board president's perspective, one of the most challenging aspects of a mishap investigation is communicating the board's conclusions to the convening authority (and higher in some cases). Rightly or wrongly, the outbrief tends to be perceived as a "report card" on the president's work. In reality, virtually every Air Force investigation tends to be conducted with a high degree of professionalism; the only variability is in how well that work is encapsulated and presented. Remember that no matter how thorough your safety investigation was, you will have failed if you cannot concisely and accurately communicate the mishap sequence and its contributing factors to outsiders not privy to your deliberations. You must justify your recommendation(s) to USAF senior leadership so that actions may be taken to prevent or mitigate the recurrence of a similar mishap. Normally the convening authority receives the outbrief prior to anyone else. However, the NAF commander may request an informational briefing prior to the convening authority's brief. The SIB president also may give a practice brief to the MAJCOM safety office of the convening authority. Any changes made following the briefing to the NAF or the practice brief to the MAJCOM safety office should be limited solely to adding explanation and polishing presentation.

5.13.1. Briefing Preparation Tips. The keys to a successful outbrief are, like so many other written and verbal forms of communication, accuracy, brevity, and clarity. With those elements in mind, consider the following in the building of a mishap briefing:

5.13.1.1. The MAJCOM staff or AFSC Representative will likely have a set format of briefing slides to use for the commander.

5.13.1.2. Be careful with scanned or other "bitmapped" images in computer-generated briefings. If improperly prepared, they can consume significant amounts of memory, and often result in briefings that are too large for e-mail and bog down during presentation due to their huge size. Since the presentation will be projected from a computer screen, any resolution greater than 100dpi (dots per inch) will not increase fidelity, but will consume enormous amounts of memory. The scanner's ability to capture images at 600 or 1200 dpi is only of value when physically print-

ing or enlarging them during electronic manipulation. Ensure that the original scans of documents and photos are set to 75 to 100 dpi and then compressed by saving them in an efficient format like .jpg. All MAJCOMS have the ability to directly present briefings saved on 100MB Zip disks. Another very inexpensive option is to make a compact disc of the final briefing.

5.13.1.3. Videos (animations, simulations or re-enactments) make excellent supporting material provided they help explain the mishap sequence. Don't fall into the trap of using a video simply because it is perceived as standard. Making a video is time consuming and usually requires a primary board member to oversee production. Usually, the best-suited members are the pilot member, investigating officer, or the commander's representative (if he or she is qualified on the type of aircraft involved). Losing a primary member for several days is detrimental to SIB deliberations.

5.13.1.3.1. The best video is of the actual mishap. However, simulator recreations or video of aircraft demonstrating specific maneuvers or sequences can also greatly aid understanding of the mishap. As a bonus, videos can serve as excellent training materials for after-the-fact use by safety personnel.

5.13.1.3.2. It is possible to electronically store videos using various compression formats such as .mpg, .avi, or .mov. The Microsoft PowerPoint software will allow such videos to be embedded. This type of construction makes the logistics of the actual presentation much easier provided the videos aren't too large and slow down the computer.

5.13.1.4. Pictures of the board in action are as unwelcome in the outbrief as they are in the report itself. Stick to the circumstances of the mishap, not details of its subsequent investigation.

5.13.1.5. Briefing scripts serve two useful purposes: (1) they require organization and clarity to prepare; and (2) they permit future presentations of the outbrief by individuals not personally involved in the investigation. They allow for crucial material needs to be conveyed exactly, word for word. A script should be used to help build the board president's mastery of the briefing. A briefing script should be produced even if the board president elects to speak extemporaneously or from talking points alone when actually presenting the outbrief. These methods permit digressions and tangents to be pursued gracefully, and questions to be answered as they arise. They can, however, lead to undue distractions or interruptions when the mishap being briefed attributes causal factors that are strongly challenged by the senior staff in attendance. When faced with briefing a contentious mishap, it is highly recommended that a briefing script be produced and adhered to.

5.13.2. Briefing Structure Tips. The following basic sections of a mishap outbrief can be tailored to the specific requirements of any given mishap sequence. They are best used as a starting point for outlining board proceedings, deliberations, and conclusions. See AFI 91-204 for further details on each of these steps.

5.13.2.1. Title.

5.13.2.2. Board Composition.

5.13.2.3. Overview.

5.13.2.4. Mishap Sequence: Describe the mishap from an appropriate starting point (mission tasking, mission briefing, etc.); end with a summary of the disposition of all involved resources (e.g., "Pilot ejected successfully; aircraft crashed and was destroyed with no collateral property damage").

5.13.2.5. Analysis: A “factor” is any unusual, out-of-the-ordinary, or deficient action or condition discovered in the course of a mishap investigation that in the board’s opinion contributed to the eventual outcome, or is indicative of a pattern of less than adequate decisions or conditions, which recurred throughout the investigation. The analysis portion includes the following categories:

5.13.2.5.1. Areas Determined Not to be a Factor and Not Warranting Discussion. Usually just a listing with little or no discussion.

5.13.2.5.2. Areas Determined Not to be a Factor But Warranting Discussion. Try to limit presentation to one slide per factor; expand upon explanation with illustrations (photos, diagrams, video, etc.), if necessary.

5.13.2.5.3. Areas Investigated and Determined to be a Factor. Expand on these items as much as necessary with all supporting illustrations as applicable.

5.13.2.6. Findings: Present board findings in numerical order. Do not include causal-agent-area-reason (CAR) for causal findings. Don’t put too much text on a single slide; usually, not more than 2-3 findings per slide is about right for legibility. The presenter does not usually discuss findings. Just show the slide, let the audience read it and answer any questions.

5.13.2.7. Actions Taken to Date: If during the course of the investigation any corrective or preventive actions were taken (by the owning MAJCOM, Air Force Materiel Command, the Air Force at large, or other agencies as appropriate), briefly describe them.

5.13.2.8. Recommendations: Include the full text of each recommendation, the OPR, and the OPR’s initial assessment (if any action was taken during the course of the investigation). Include suspenses as appropriate. Usually, a maximum of two recommendations per slide is best, since recommendations often tend to be lengthier than findings.

5.13.2.9. Other findings and recommendations of significance. Include deficiencies uncovered by the board that were not part of the mishap sequence as well as your suggested corrective actions. Each slide will contain the OFS and associated ORS.

5.13.2.10. Back Up slides: These are very important. Anticipate any and all questions from the convening authority and staff and develop a back up slide, as appropriate to answer these questions.

Section 5G—Closing Down the Board

5.14. Transferring Control of the Wreckage:

5.14.1. Removal of Wreckage from the Scene. Recoverable wreckage is normally collected by the Air Force in conjunction with the environmental clean up of the site. ***The Disaster Response Force’s On-Scene Commander may relinquish control of the aircraft wreckage to the SIB, however the OSC will always retain control of the mishap site.*** Under normal circumstances the SIB will convene first and then hand over all factual evidence and records to the AIB in the final week of the SIB. The following would then apply:

5.14.1.1. The convening MAJCOM always retains control of all assets under its command (this is done through a custodial chain normally sequencing the SIB president, the AIB president, and then the MAJCOM/JA’s office.).

5.14.1.2. The convening authority specifically delegates control of personnel and materiel to the SIB president with the formal publication of SIB orders.

5.14.1.3. The SIB president has the unchallenged right to move some or all wreckage to facilitate investigative efforts; however, this right is subject to the OSC's charter to abate imminent hazards or restore critical base or civilian functions (runway operation, highway transit, residential or commercial neighborhood access, etc.). Securing the mishap site and preserving it for the AIB is extremely costly in both human and material resources, it is generally impractical and seldom done. Normally, physical evidence is removed from the crash site within 7-12 days of the mishap. Environmental clean up of the crash site is then completed and the site is returned to its legal owner.

5.14.2. As a general rule, during the duration of the ISB, wreckage that does not urgently need to be moved should not be. Once the SIB has completed its analysis and full factual documentation of the mishap site, primary and secondary evidence will be removed from the crash site to a location designated by the assigned USAF supporting Wing. Should the SIB president determine that the AIB must be given the opportunity to examine the mishap evidence in place, he will contact the convening MAJCOM and request that the AIB immediately travel to the mishap site. Upon arrival of the AIB, the SIB will withdraw from the mishap site until the AIB has completed its inspection of the wreckage. When partial or total reconstruction and/or analysis efforts necessitate shipment of wreckage/evidence to other locations, it is incumbent upon the SIB president to provide a complete written inventory of these components, their exact location, an office of primary interest, and a phone number to the AIB president. It is not necessary for the SIB to return wreckage/evidence that has been pieced together, or disassembled, for analysis to its original state. However, labels, markings, rulers and other identifying or quantifying information must be removed from the wreckage/evidence, and/or storage location prior to transfer to the AIB. Labels denoting location of pieces in the debris field in reference to a grid map can remain.

5.14.3. Disposing of Wreckage Records. The SIB releases original aircraft records to the AIB president, making copies as required for the SIB formal report. If the AIB has not yet convened when the SIB is ready to transfer records, records may be transferred to the staff judge advocate of the nearest active duty Air Force installation or other MAJCOM-designated legal custodian.

5.15. Handing Off and Disposing of Factual/Non-Privileged Evidence. When the SIB completes its investigation and reporting tasks, it will have numerous documents, non-privileged analysis reports, records, and other items of evidence. The SIB president, will turn over all of these and Part I of the formal safety report over to the AIB president as soon as possible. This includes such items as:

5.15.1. Individual flight, training, and standardization records.

5.15.2. Mission planning materials.

5.15.3. Flight plan and weather briefing (original documents).

5.15.4. Crew orders and passenger/cargo manifests.

5.15.5. ALC technical experts reports (normally already included in Part One).

5.15.6. Results from AFIP drug screening and autopsies.

5.15.7. Contractor technical experts reports (when promises of confidentiality are not given). Contractor reports may be privileged if given under a promise of confidentiality and are then included in Part Two.

5.16. SIB Working Papers and Drafts. Any privileged material must be duly protected since it may point to the SIB's deliberations, analysis and/or conclusions. The AFSC representative will take all of this material to HQ AFSC at the end of the SIB. Once HQ AFSC has produced the mishap memorandum of final evaluation (MOFE), SIB privileged materials that were not included in the formal report must be disposed of. No member or technical expert assistant to the safety board is permitted to retain copies of any such materials for any purposes without the express consent of HQ AFSC/JA. Once the MOFE is complete, the AFSC representative will destroy this information. This includes such items as:

- 5.16.1. Individual member notes and observations reflecting other than factual information.
- 5.16.2. Drawings and staged photographs created for analysis purposes but not included in the report.
- 5.16.3. Wall charts showing specific theories regarding the mishap sequence, specific failure modes, etc.
- 5.16.4. Any analysis produced by non-USAF agency that requested a promise of confidentiality.
- 5.16.5. Privileged testimony that was not included in the formal report.
- 5.16.6. Notes containing specific rationale for accepting or rejecting various lines of inquiry or for abandoning specific theories.
- 5.16.7. Notes specifically geared toward aiding the SIB president in completion of the outbrief. .

5.17. Handling and Disposing of Other Sensitive Materials:

5.17.1. The Formal Report:

5.17.1.1. Do not release any more copies of the final report than are explicitly authorized by AFI 91-204. During the course of the investigation, the recorder should have made advance copies of various reports and tabs in anticipation of the hand-over of part one of the formal report to the AIB and the formal report final production requirements. Since the exact number of copies of the final report that will be required is dictated to some extent by the OPRs assigned to the SIB's recommendations, it is best to produce at least two extra copies and then destroy the excess.

5.17.1.2. Do not provide copies of the report to any agency or individual not explicitly authorized to receive a numbered copy.

5.17.1.3. Do not permit any mishap participant access to the formal report for any reason.

5.17.1.4. Contractors, contractor representatives and other technical assistants may not retain copies of any privileged reports they prepare for inclusion in Tab W of the final report. Any report they may be required to turn in to their employers upon their return, must be produced as a totally different entity and use only strictly factual information they gathered through their examination of physical evidence. These company reports must not contain any privilege information or conclusions that were derived from SIB testimonies and/or analysis.

5.17.2. Post-Mortem Photographs and Other Photographs Not Used in the Formal Report.

5.17.2.1. It is extremely important to understand the special requirements for handling photographs of crash victims:

5.17.2.1.1. Do not include photographs of human remains as part of the formal safety report.

5.17.2.1.2. Ensure the medical member of the SIB controls all copies of prints and negatives. Investigating officers should be aware that the medical member may have certain report requirements beyond those imposed by the safety investigation. For these reports, photographs of deceased crewmembers may be required. Such reports are not privileged but carry with them their own handling caveats.

5.17.2.1.3. The medical member should personally provide a copy of all post-mortem photographs to the AIB.

5.17.2.2. The investigating officer should compile a comprehensive file of all non-staged (non-privileged) photographs taken throughout the investigation. Once no longer needed by the SIB, the president ensures a copy of all such photographs and their negatives is provided to the AIB president (remember that post-mortem photographs need special handling, see above paragraph). If photographs are taken with a digital camera, care must be given to ensure that privileged and non-privileged photographs are not mixed on the same storage device, normally a CD-ROM.

5.17.3. Autopsy Reports. If the Armed Forces Institute of Pathology sends their autopsy report to the SIB, it is to be retained by its medical member and copies provided to the AIB president and the convening MAJCOM's surgeon general. Autopsies are included in only copy one of the formal safety reports. This is the master copy that will be retained by HQ AFSC as the USAF permanent record to this mishap.

Chapter 6

TECHNICAL ASSISTANCE

6.1. What It Is:

6.1.1. Modern aircraft are extraordinarily complex systems. In the past, a course in crash dynamics, structures, and failure mode analysis was enough to allow Air Force investigators to analyze wreckage and failed components without further assistance. Today, time-tested “tin-kicking” skills are still essential to efficient investigations, but frequently, expert help is also required.

6.1.2. Circumstances surrounding a given accident may require the services of professional fire pattern specialists or other specialists to interpret crash-damaged instruments, evaluate egress and life support equipment, assess breakage patterns in composite materials, and so forth. In the case of a bird/wildlife strike, an expert bird/wildlife aircraft strike hazard (BASH) biologist will be required. The Air Force maintains access to expertise in virtually any technical discipline imaginable. This expertise may reside within the Air Force, another government agency, or with a contractor.

6.1.3. Prime contractors and subcontractors who supply aircraft and specialized components to the Air Force are often uniquely well equipped to analyze the failure of their equipment. It is often in the Air Force's interest to solicit this type of assistance during an investigation, principally in three cases:

6.1.3.1. When technical expertise or teardown facilities are not available within the Air Force.

6.1.3.2. When teardown or analysis will require the use of trade secrets or proprietary information not available to the Air Force.

6.1.3.3. When contractor participation will ensure prompt correction of deficiencies or materiel defects, e.g., through promulgation of an immediate Change Proposal or similar instrument with mishap prevention or operational enhancement value.

6.2. When to Ask for It:

6.2.1. It is important identify what type of expert help you will need and to ask for it early. The sooner you make a request, the better. Within the first few days after a major mishap, people are trying to put together a SIB, emotion is high, and the chances of getting the people you need are much better if you can quantify your needs early.

6.2.2. Source as much generic help as you can locally from the supporting installation or the mishap aircraft's home base if practical, but then determine what other specialized knowledge you're likely to need and ask for it. Virtually all major mishaps need some sort of technical assistance, usually in aircraft-related engineering disciplines (e.g., engine performance and teardown, flight control and structural analysis, instrument and flight data recorder readout, etc.). So, such requests are expected. Technical experts from an Air Logistics Center and safety shops of aircraft and engine manufacturers are frequently required, particularly if the aircraft is scattered in small pieces all over the ground.

6.2.3. Moderate your desire to bring in hordes of “hired guns.” Calls for assistance should be just that—a request for technical specialists to *assist* the SIB with the investigation of a mishap, not to carry it out. As a general rule, identify problem areas and request assistance in these areas. Except for possible bird/wildlife strikes (see **paragraph 6.2.4.**), do not immediately request assistance for areas that have a low probability of being factors. For these areas, allow things to settle down and see if they

look more like areas that need to be investigated or whether they can be ruled out. Board members who have received formal safety training have all of the basic tools needed to successfully carry out many investigations. It's not necessary to bring an engine specialist to the scene if it is obvious that the aircraft crashed because of an unrelated system. Similarly, detailed examination of wreckage and crash-damaged components may be completely unnecessary if the board can reasonably conclude that crew performance alone caused the mishap, and was not degraded by malfunctioning or defective equipment. Be aware however, that systems may have to be analyzed to prove that they were functioning properly. The bottom line is: use good judgment in asking for help, but don't hesitate to do so if you're faced with conditions or circumstances that exceed the board's corporate expertise.

6.2.4. Biological evidence (animal remains) deteriorates with exposure to the environment and bird populations are dynamic, often changing drastically in a short period of time. Make a request for a BASH expert as soon as possible.

6.2.5. Generally, it's appropriate to bring in technical assistance at any point in an investigation, but considering the reasons stated prior, the sooner, the better. Contractors, particularly those in the Foreign Military Sales business, are usually more than eager to participate the moment they're asked. Make sure they will represent the best possible solution to your investigative challenges before requesting their assistance.

6.3. How to Get It:

6.3.1. Requests for technical assistance to safety investigations are routed through MAJCOM channels to HQ AFSC/SEF. The HQ AFSC representative is normally a SIB's liaison to request technical assistance. In the absence of a HQ AFSC representative, select one individual to coordinate all requests for technical assistance. The quality of help obtained varies directly with the amount of information relayed to the convening authority safety office or HQ AFSC/SEF about the mishap. Be as specific and informative as possible when making a request for technical assistance. The HQ AFSC/SEF Technical Assistance Hotline is available 24 hrs/7 days a week at DSN 246-5867, commercial: 505-846-5867. After normal business hours, stay on the line to obtain after hours contact information ñ someone can always be reached regardless of time of day, weekend or holiday.

6.3.2. The Air Force Safety Center has resident BASH and engineering expertise in many commonly needed disciplines, and frequently can provide technical assistance out of its own resources. If not, the system program director and item managers for the involved weapon system are required to provide technical assistance to SIBs, and each agency budgets funds for this purpose. Additionally, technical resources can be drawn from elsewhere within Air Force Materiel Command, other government agencies, and the civil aerospace industry whenever necessary.

6.3.3. Board presidents and board members must refrain from unilaterally involving experts they might be familiar with. Serious legal problems and financial claims against the government can result due to possible infringement on existing USAF contractual obligations. Routing requests through the MAJCOM to AFSC/SEF will alleviate any potential problems in this area.

6.3.4. Technical assistance may be on the way, whether you asked for it or not. System program directors maintain 24-hour points of contact with each of their major contractors. Therefore, it's highly likely that the contractor found out about a given mishap and assembled an appropriate response team before most members of the permanent board were even notified an accident had taken place. Remember: safety boards are in NO WAY obliged to grant contractors (or other uninvited "visitors")

access to accident scenes or failed components. Normally, most contractor representatives will not respond to a mishap unless their participation has been requested through HQ AFSC/SEF as detailed above.

6.3.5. Most contractors maintain a small cadre of “technical safety” or “product safety” personnel available for short-notice dispatch to accidents involving their systems. The Air Force Safety Center also hosts representatives of several prime contractors within its headquarters, each of whom is similarly available to assist in any way requested. If contractor help is needed, go through MAJCOM channels to HQ AFSC/SEF. SIBs will maintain a liaison with HQ AFSC through their AFSC representative.

6.4. How to Use It:

6.4.1. Immediately upon arrival, technical experts must be briefed on how their contribution to the investigation will be used. Regardless whether the experts are government employees (military or civilian) or non-DOD employees participating under technical engineering contracts provided by system program directors, their *releasable* reports must be limited to observations, determinations based upon those observations and generally accepted engineering data and analyses, and recommendations. For *non-releasable* reports, additional information, such as proprietary data and opinion, may be included as well. Regardless of the type of report written, technical experts should interact with board members because their information is ultimately integrated into the overall report. Non-DOD employees are required to read, understand, and sign a letter explaining how their analysis is subject to privilege; see [Figure 6.1](#) for a sample and AFI 91-204, paragraph 4.7 for detailed instructions.

6.4.2. Technical experts have a pronounced “halo effect.” Most have participated in many more investigations than the average Air Force board member. Technical experts offer insight in specifics of material or human behavior, but it’s up to each board to take their information and apply it to the operational environment within which the mishap took place.

6.4.3. Board presidents need to stay in control, and be aware of the tendency to defer to technical experts, particularly when they stray away from their area of expertise. For example, an expert in intra-cockpit communications suddenly begins to offer up theories on spatial disorientation or operational procedures. All technical experts must be required to thoroughly defend their conclusions, since in all likelihood they will not be present when the board’s conclusions are presented to the convening authority. Further, the board president must set the pace and tone of the inquiry. He or she probably can’t tell the experts how to do their jobs (or they wouldn’t have been needed in the first place), but they can keep them working at it and require regular updates. In past cases where the SIB was disappointed in the technical assistance provided, it sometimes turned out that the experts were equally disappointed in the guidance the SIB furnished – this is especially true when it comes to laboratories performing teardowns on key components with little SIB participation. If the SIB president is not satisfied with an expert’s report, return it for rework. Do not release experts until all primary board members have reviewed his or her report and all of their questions and comments have been satisfactorily addressed.

6.4.4. Once accepted by the board and signed by the author, no part of an expert’s report can be changed – especially those that are *releasable*. It’s up to the board to make them a coherent part of their overall report laying them out in an orderly fashion, substantiating them, and eliminating (or at least addressing) other reasonable possibilities as appropriate. The board may also reject an expert’s conclusions if they can defend doing so; however, a rejected report should still be included in the

appropriate section of the formal report (based upon whether the report was intended to be releasable or non-releasable) with a detailed explanation in Tab T as to why the report or conclusions were dismissed.

Figure 6.1. Letter for Contractor Representatives to Safety Investigations.

MEMORANDUM FOR (Non-Air Force technical expert's name and company/organization)

FROM: (SIB President)

SUBJECT: Protection of USAF Privileged Safety Information

1. In response to my request for technical assistance, the Air Force and your employer have agreed that you will serve as a technical expert for the Safety Investigation Board (SIB) over which I preside. Unless you specifically identify information provided in your technical report as proprietary data or confidential analysis or opinion, it will be included in the releasable portion (Part I) of the SIB's final report as factual material. If you want us to treat any part of your report as privileged information so we can protect it from disclosure outside the Department of Defense, you must specifically request such protection. In such case it will be included in the privileged portion (Part II) of the formal safety report and will be used solely for mishap-prevention purposes.
2. The military safety privilege protects confidentially provided evidence and the deliberative process of the SIB. It enhances the SIB's ability to identify potential causes of mishaps quickly and accurately so we can prevent their recurrence. This process must have the highest degree of reliability to maintain combat readiness, national security, and public safety.
3. In accepting your appointment to serve as technical expert, you must agree to safeguard our safety privilege. You must not disclose to anyone, including your employer, any privileged information derived from our investigation. You will prepare only one copy of your technical report for the SIB. You will destroy or surrender to me any notes, documents, computer files, or other materials, produced or obtained during this investigation, if they contain privileged information. You must not make copies of any privileged documents (including analytical computer products, confidential tape recordings, and staged photographs) for use outside the proceedings of this board. You may not have a copy of Part II of the Board's final report or any part of a draft thereof. You must report to me (or, after the SIB is dissolved, to HQ AFSC) any attempt by anyone, other than a SIB member or other duly authorized person, to obtain any confidential or deliberative information from you about this investigation.
4. Before beginning your service to this Board, please sign and date the endorsement below. I will give you a copy of this memorandum.

(Board President's signature block)

1st Endorsement

To: (SIB President)

I acknowledge understanding of the contents of this letter and receipt of a copy thereof, and I agree to comply with the duties and responsibilities stated therein.

(Technical expert's signature block)

(Date)

Chapter 7

WITNESS INTERVIEWS

7.1. Introduction:

7.1.1. Definitions:

7.1.1.1. Witness. For the purposes of USAF safety investigations, the term “witness” is a general term referring to those persons who may be connected, even remotely, with the mishap. A witness may be a participant in the mishap, such as surviving crewmembers or personnel who maintained, serviced, scheduled, or controlled the system on the ground or in flight. A witness may also be someone not directly connected with the operation of the system, but who actually saw or heard some portion of, or a series of, events leading up to and including the actual mishap. Finally, recognized experts in a given field, when providing technical data or theory of system operations or when giving opinion or speculative postulations, which the SIB may wish to explore, are also considered to be witnesses.

7.1.1.2. Interview. For the purposes of USAF safety investigations, the term “interview” is used to characterize the setting and tone considered most useful for eliciting information. Interviews are cooperative, informal meetings where the interviewer approaches the witness as an equal and encourages their cooperation, allowing him or her to relate observations without interruption or intimidation. By contrast, “interrogation” implies questioning on a formal or authoritative level, such as a lawyer-to-witness situation or a police officer-to-suspect session. Witness interviews conducted as a part of USAF safety investigations should never have the appearance of being interrogations. When safety investigators explain the safety and mishap prevention value of their testimony, most witnesses willingly give their observations.

7.1.2. The Challenge of Interviewing. Interviewing a witness is one of the most difficult and least understood tasks of a SIB. Witnesses can provide valuable information, but, if the interview is improperly handled, the information may be lost or even incorrectly presented. The importance of witness testimony varies with the type of mishap and location, but all testimony must be received and examined uncritically. Witness statements and physical evidence go hand-in-hand in determining the cause of a mishap. Each may complement or clarify the other, and investigators may not realize the importance of seemingly innocuous testimony for days or even weeks after it is taken. Therefore, the evidence obtained from witnesses should be as complete and detailed as possible. Bear in mind that interviews are not dialogues; interviewers who share information gained from other witnesses or other aspects of their investigation are violating the privileged nature of that information, and may be tainting their witness’ recollection as well. “Prompting” and leading questions are easy traps to fall into, and must be avoided. This subject is discussed at length later in this chapter.

7.1.3. The Purpose of Interviewing. Safety investigators initially interview mishap witnesses with three objectives in mind:

7.1.3.1. Find out what the witness knows.

7.1.3.2. Establish a preliminary direction for the investigation.

7.1.3.3. Complement other phases of the investigation.

7.1.4. **Obligation of the Safety Investigator to Subsequent Investigations.** Safety investigators are required by AFI 91-204 to provide a complete list to the AIB of all witnesses they contacted once the SIB has completed all of its interviews. This means the SIB must keep scrupulously accurate records of all witnesses, regardless of whether or not their testimony was considered relevant or worthy of inclusion in the formal report. It also means that safety investigators must treat all witnesses courteously and correctly, to ensure a similar degree of cooperation is accorded the AIB which follows.

7.2. Privilege, Confidentiality, and Truthfulness Considerations:

7.2.1. **Explaining the Purpose and Handling of Testimony.** Mishap participants are usually offered confidentiality (privilege) in exchange for their truthful statements on what transpired during the mishap. However, witnesses may or may not be offered this privileged status. For those that are not offered this status refer to AFI 91-204, Figure 2.4. When offering privilege to a witness use the exact language in AFI 91-204, paragraph A3.6.1.2. to advise each person giving testimony or providing a statement that:

7.2.1.1. The SIB is conducting the investigation solely for mishap prevention purposes within the USAF.

7.2.1.2. The USAF will not release his or her statement outside the USAF safety community, nor will it be used as evidence in disciplinary actions, non-judicial punishment or adverse administrative actions such as administrative discharge proceedings, demotions, letters of reprimand, flying evaluation boards, determining line of duty status, pecuniary liability, or elimination from the USAF.

7.2.1.3. The USAF will use his or her statement solely to determine factors relating to the mishap and to prevent recurrence.

7.2.1.4. Witnesses acknowledge that they understand the concepts above by verbally stating so (in taped interviews) or signing a statement containing the prescribed language (AFI 91-204, Figure 2.3). If you do not have access to the most current version of AFI 91-204, read the following statement directly onto any taped interviews:

“You are hereby advised that, as a witness to this investigation, your testimony will be used solely for mishap prevention purposes. Your statement will not be made available to anyone other than Air Force officials responsible for the assembly and approval of this investigation’s report. The only exceptions to this would be to act on an allegation of false testimony or investigative misconduct, or to comply with a valid court order on behalf of a defendant in a criminal trial. Your statement may not be used as evidence by the Government in punitive actions or adverse administrative actions, such as a Flying Evaluation Board, a determination of line of duty status or pecuniary liability, or elimination from military service.”

***Technique:* “Do you understand how your testimony will be used, and are you willing to proceed with this interview?”**

7.2.2. **Accuracy of Unsworn Testimony.** Safety investigators never advise witnesses of “their rights.” Testimony to safety investigators is accorded privileged status, and witnesses are guaranteed confidentiality IAW AFI 91-204. It is otherwise unsworn, since investigators are specifically prohibited from taking safety-related testimony under oath. However, the Air Force requires all such testimony from its personnel to be truthful to the best of the member’s knowledge. An officer who fails to present a true accounting of facts involved in a mishap is committing an act of professional dereliction.

tion. While an officer's testimony may not be used against him/her if it is self-incriminating, the Manual for Courts-Martial contains penalties for the making of false official statements themselves. Further, AFI 36-3206, *Administrative Discharge Procedures for Commissioned Officers*, AFI 36-3207, *Separating Commissioned Officers*, and AFI 36-3209, *Separation Procedures for Air National Guard and Air Force Reserve Members* all state that the Secretary of the Air Force may direct a discharge under other than honorable circumstances, or a discharge under honorable conditions (general), if an officer intentionally misrepresents or omits facts in official statements. Investigators who interview Air Force members should presume that they are receiving truthful testimony unless clear inconsistencies lead them to conclude otherwise. In cases where testimonial accuracy is suspect, investigators should contact HQ AFSC/JA for advice on how to proceed. Do not contact local staff judge advocates or area defense counsels, and do not threaten witnesses with the penalties described; often a simple appeal to the individual's sense of duty will elicit the truth.

7.2.3. Special considerations for investigations in which promises of confidentiality are not authorized. Users of this pamphlet who conduct witness interviews, as a part of investigations in which promises of confidentiality are not authorized must not offer any of the protections described in 7.2.1. It is appropriate to restate the sole purpose of USAF safety investigations, namely, to prevent the recurrence of mishaps, but witness testimony to investigations in which promises of confidentiality are not authorized is not accorded special handling or protection. Investigators in such cases must advise witnesses of their rights under the Fifth Amendment to the Constitution (civilian) or Article 31, Uniform Code of Military Justice (UCMJ) (military). (Providing AF Form 1168, *Statement of Suspect/Witness/Complainant*, for signature of the subject witness fulfills this purpose). In questionable cases, ask the staff judge advocate for advice.

7.3. Identifying Potential Witnesses Following a Mishap. The governing principles associated with the gathering of useful testimony are *timeliness*, *proximity* of the witness to the mishap, and *unrecognized relevance*. Investigators must consider all three factors in their information-gathering process.

7.3.1. *Timeliness.* Witness information depends on recall and perception, both of which are affected by the passage of time. The human mind has a tendency to fill gaps in recollection through logic or filling-in based on their own experiences; the longer witnesses have to reconsider events, the more they subconsciously tend to do this. To maximize the likelihood of obtaining useful testimony, it is normally advisable to interview all available witnesses, and to do so as quickly as possible. Visit witnesses again later if the SIB needs additional information or clarification of their statements. Bear in mind the possibility that their description of what they saw might change once they have time to reflect and their second impressions probably will not be as useful as their first.

7.3.2. *Proximity.* Witnesses are usually divided into direct participants in the mishap and ones who observed any part of the mishap sequence:

7.3.2.1. Participants:

7.3.2.1.1. Take the statements of the mishap crew as soon as possible, considering their physical condition. The initial interview is often obtained by the flight surgeons in conjunction with the medical history they take as part of their initial medical response. In general, flight surgeons are usually the most experienced interviewers on the ISB and SIB since interviewing is part of their day to day non-mishap responsibilities. Consult the flight surgeon or other medical personnel to determine when and for how long the SIB may question them. Be sure to note

if they are under any medication at the time they are interviewed or provide a written statement.

7.3.2.1.2. Under no circumstances are investigators to interfere with the medical treatment of an injured party in an effort to obtain testimony.

7.3.2.1.3. Identify the last persons to have performed maintenance or servicing on the mishap aircraft, and ensure they are interviewed as soon as possible and toxicological specimens are taken, if required. Contact USAF safety personnel at other installations as necessary to conduct such interviews. If personnel from other DOD services were involved in servicing, cargo or armament loading, or other operations associated with the mishap aircraft, contact the Air Force Safety Center for assistance as soon as possible.

7.3.2.1.4. Identify air traffic facilities along the mishap aircraft's route of flight, and ensure that they impound their tapes for analysis. Also, have FAA/host nation supervisory personnel inquire as to the willingness of their on-duty controllers to provide additional statements or testimony.

7.3.2.2. Observers:

7.3.2.2.1. Spectators and sightseers, who are at the scene when the investigator arrives, frequently heard or saw something that attracted their attention to the mishap and brought them to the scene. Talking to these people immediately on arrival may give the investigator information regarding the flight path, actions, and sounds of the mishap. Statements should be taken from all such witnesses immediately after the mishap, before they have time to compare stories with other witnesses. It is often useful to conduct the interview at the exact location of the interviewee at the time they witnessed the mishap.

7.3.2.2.2. Other flight crews in the vicinity at the time of the mishap may be particularly helpful in establishing local weather conditions, or in relating relevant radio transmissions from the mishap aircraft that may not have been recorded (calls on local unit frequencies, self-announcing on UNICOM, etc.)

7.3.2.2.3. Persons many miles from the point of impact may have useful information as well; this is especially applicable in cases of suspected engine or structural failure, weather mishaps, and fire in flight. It is possible to obtain evidence of smoke, fire, low flying, unusual maneuvers, erratic engine operation, structural failure, and loss of control from observers along the route flown who were not necessarily witnesses to the actual crash. Therefore, investigators must be prepared to retrace the mishap aircraft's route of flight to identify potential witnesses as necessary.

7.3.2.2.4. Local police and news media personnel can often be helpful in locating witnesses, and it is quite possible that they will find some witnesses with valuable information before a USAF investigator can. In some cases, it may be worthwhile to advertise for witnesses or have the news media advertise for them, but investigators should pursue these avenues only with the assistance of a qualified Air Force public affairs officer.

7.3.3. Unrecognized Relevance. Sometimes in the course of an investigation, witnesses emerge who were not immediately identified as having useful information to offer. This is why it is critical to keep careful records of all potential witnesses, even if investigative resources are not available to pursue them all immediately. This is also why the mass gathering of written statements from a large group of

observers of a mishap is a good idea; everyone has a slightly different vantage point and experience base, and a meaningless detail to one person may be a glaring discrepancy to another.

7.4. Immediate Post-Mishap Management of Witnesses:

7.4.1. Preparing for Initial Interviews. Assemble an interview kit before interviewing witnesses:

- 7.4.1.1. Tape recorder with counter, external microphone, tapes, and extra batteries.
- 7.4.1.2. Videotape recorder and tripod, with an external microphone, spare tapes and an electrical adaptor. Consider using a videotape recorder as it's almost impossible to transcribe a person's interview accurately if they use their hands a lot or are displaying what they saw with a model unless there is a video record of the interview.
- 7.4.1.3. An ample supply of witness statement forms.
- 7.4.1.4. Model aircraft (one of a small, toy store variety will suffice for general purposes, but an actual model of the involved aircraft is better).
- 7.4.1.5. Compass.
- 7.4.1.6. Angle measuring equipment.
- 7.4.1.7. Watch with sweep second hand or digital seconds counter.
- 7.4.1.8. Appropriate charts and maps on which to plot witness locations (if available).

7.4.2. Making Initial Contact with On-Scene Witnesses. When mishaps occur, there can be situations ranging from no witnesses to mishaps observed by literally tens of thousands of people. When faced with an abundance of witnesses and a limited time to conduct the investigation, it is imperative to develop a plan to sort out the important witnesses needed for in-depth interviews. Evaluate each mishap based on the known facts surrounding it, then use the following general strategy to set interview priorities:

- 7.4.2.1. Sketch out (or use maps or photos of) the mishap area, then try to select witnesses from strategic points along the ground track (aircraft or missile mishaps) or around the mishap area.
- 7.4.2.2. At the earliest opportunity, establish potential witness physical position relative to the mishap, and make a quick assessment of their quality, credibility, and reliability (see **paragraph 7.7.**) before committing significant time to an individual interview.
- 7.4.2.3. Interim investigators must characterize the contribution each potential witness could make to the investigation; some may have seen the aircraft prior to impact, others may have seen in-flight ejection or bailout attempts, and still others may have seen or assisted in post-crash recovery of the dead and injured. Each may have made useful observations, and all must be followed up based on their relevance to the mishap sequence and its aftermath.
- 7.4.2.4. If the number of witnesses available exceeds the number of designated primary-duty safety personnel or appointed ISB members available, do not use security forces or civilian law enforcement personnel to expand your information collection effort. Instead, get all bystanders' names, telephone numbers, and addresses so that the permanent SIB can follow up for more detailed information. Ask observers to briefly write down what they saw and have them ready for a follow-up call within a few days.

7.4.2.5. If you anticipate large numbers of written statements will be collected on the spot, photocopy **Figure 7.1.**, fill it out with all the pertinent information and attach the witness statements to it.

7.4.3. The interim board's first impressions and initial assessment of the potential usefulness of witnesses are important. If a witness appears credible and reliable, or if they have a unique vantage point not shared by others, their value to the permanent board will be significant. If it initially appears that a witness at the scene is unlikely to contribute significant information or corroborate another's observations, they should still be asked to provide a written statement. All potential witnesses must be identified, logged, and given an opportunity to provide at least a written statement as quickly as possible after the mishap.

7.4.4. Handling Self-Identified Witnesses Away from the Scene. Post-mishap publicity frequently attracts calls from previously unidentified witnesses. While some of these may be from "cranks," the vast majority will be from people who are genuinely concerned and wish to help the investigation. In some cases, such a caller may provide the key to a mystery, having found a critical part or observed something unusual in flight. Every unsolicited call-in must be followed up; however, depending on the direction your investigation has taken, the follow-up may require nothing more than a simple return call and brief telephone interview. Ensure all witnesses are added to the witness list for the AIB with all of the pertinent data required to contact them in the future.

7.4.4.1. All such self identified witness callers should be:

7.4.4.1.1. Thanked for making the effort to call.

7.4.4.1.2. Advised of how their testimony will be treated (see **paragraph 7.2.1.**).

7.4.4.1.3. Asked to summarize what they have seen or found. Depending on the testimony, it may be helpful to review the "memory jogging" questions provided at **Attachment 5.**

7.4.4.2. Upon completion of a return call telephone interview, the interviewer:

7.4.4.2.1. Adds the witness's identifying information to the list of witnesses maintained for subsequent investigations.

7.4.4.2.2. Lists the date and time of the interview and summarizes any information elicited from it.

7.4.4.2.3. Certifies that the witness was advised of the intended use of their testimony IAW AFI 91-204.

7.4.4.2.4. Advises the board president if a follow-up interview may be warranted.

7.4.5. Organizing Initial Witness Information. ISBs need to assemble the massive amount of data regarding witnesses, their statements, and their potential usefulness to the permanent board in a readily accessible form. This ensures witnesses and the information they possess is not lost. **Figure 7.1.** and **Figure 7.2.** provide examples of how this information can be captured for ready reference by the follow-on investigators.

7.5. Organizing the Interview Process:

7.5.1. Interviewing is one of the most time and labor-intensive aspects of an investigation. It must be managed efficiently to minimize its impact on other parts of the investigative effort, but must also be

as broad an effort as necessary to ensure all relevant information is gathered. Keeping these two priorities properly balanced requires a systematic process, matching the best interviewers with the best witnesses, then scheduling interviews as soon as possible in a setting conducive to the witness's comfort.

7.5.2. In most cases, ISBs should concentrate on general information gathering, especially in locating potentially useful witnesses, and pave the way for the SIB to conduct in-depth interviews.

7.5.3. Some witnesses may not be comfortable being interviewed by uniformed SIB members due to the emotional load of their experience. The most common example is surviving family members of the deceased. These interviews are more appropriately conducted in civilian attire.

7.6. Formal Interviews:

7.6.1. The presence of multiple interviewers arrayed in front of a single witness can be both intimidating and chilling. Nevertheless, it is sometimes warranted, particularly when human error has been identified as a significant factor in the mishap. A formal interview session with the appropriate members of the SIB facilitates in-depth questions of the major participants. Normally, a maximum of two interviewers is sufficient.

7.6.2. The ideal time for formal sessions seems to occur after the SIB has been on the job for about a week and most of the dust has settled over what did and did not happen. By this time the board members should have a good grounding in the basic circumstances surrounding the mishap, and are probably prepared to ask useful questions. All primary SIB members and particularly those conducting interviews should have reviewed any interviews carried out by the ISB and any written witness statements before the SIB begins its own round of interviews. This will ensure that items missed are covered and should help cut down on repetition.

7.6.3. If necessary, interview key witnesses during formal SIB proceedings to clarify or amplify their stated observations in light of evidence gathered after they made their statements. Give them a copy of their original statements to examine. Do not attempt to change their opinions, but point out inconsistencies, and invite explanation or clarification. It generally serves no purpose to confront witnesses with evidence unknown to them. The SIB should endeavor to establish the certainty of observations in the witnesses' minds and evaluate their merit later in closed meeting deliberations.

7.6.4. Formal sessions should not normally be used if the objective is simply to gather some additional factual information from a particular witness. There's nothing wrong with asking such witnesses to make an additional statement on specific issues, nor is there anything wrong with one SIB member interviewing him or her informally and making a statement on the substance of the conversation.

7.7. Post-Interview Analysis:

7.7.1. The gathering of testimony evidence comprises about 50 percent of the witness investigation. The remaining 50 percent rely on the ability of the investigators to apply technical knowledge to the observations of lay witnesses and to emerge with possible contributing and causal factors. Analysis of witness statements, as opposed to accepting them at face value, is required to:

7.7.1.1. Assess witness *quality*.

7.7.1.2. Assess witness *reliability*.

7.7.1.3. Evaluate witness *credibility*.

7.7.1.4. Reconcile conflicting or multiple versions of the sequence of events.

7.7.2. Quality. The human mind does not work like a camera. Recall is never 100 percent (less than 100 percent of the information is stored in memory in the first place) and, because of selective attention, different people see different things. There is thus a twofold problem. What affects the information going into eyewitnesses' memory, and what affects the process of trying to find out what they remembered? Several factors affect witnesses' abilities to get a clear picture of what happened:

7.7.2.1. Environmental factors (ambient light, time of day, rain or shine, etc.).

7.7.2.2. Recognition/understanding of what they're seeing; this may be based on their aviation knowledge and experience.

7.7.2.3. Expectancy. If an aircraft is in trouble, witnesses expect to see smoke and or fire and even if there is none, the brain fills in the gap and they will remember seeing it. This same is true for hearing explosions.

7.7.2.4. Stress or trauma experienced (more stress equates to less clear memory).

7.7.2.5. Personal significance (more personal involvement equates to better memory).

7.7.2.6. Length of observation.

7.7.2.7. Time elapsed since observation.

7.7.2.8. Physical condition of the witness (age, health, fatigue state, use of alcohol, etc.).

7.7.2.9. Attitude toward the Air Force; negative attitudes taint recall, while positive attitudes may result in "filling-in" in an effort to be helpful.

7.7.2.10. Pride (if quality of observation is believed to be suspect, recall may be selective).

7.7.3. Reliability. Various other factors also tend to influence witness observations. It is advisable for the interviewer to have some knowledge of these factors to better understand why witnesses report as they do, as well as to ascertain the reliability and validity of the information:

7.7.3.1. Intelligence -- intelligence is not as much a factor in observing as it is in the area of ability to recall and in the organization of thoughts. The less intelligent witness tends to have difficulty in recalling specific detail simply because it wasn't of interest. This witness may also have difficulty in organizing thoughts and presenting observations in a coherent manner.

7.7.3.2. Emotion -- emotion tends to produce decided distortion and exaggeration, especially in the verbal description of an occurrence. The degree of accuracy depends partly on the observer's mental state at the time and partly on the complexity of the situation.

7.7.3.3. Repetition -- witnesses who have spoken to many people about their observation or experience frequently begin to exaggerate or "fill in gaps" with each retelling.

7.7.3.4. Transposition -- some witnesses may report all facts accurately, but place them out of sequence with the actual occurrence. Be aware of this possibility, and attempt to verify the sequence of events independently.

7.7.3.5. Omission -- this is common in witness statements, frequently because the witness does not consider certain information important. Omissions concerning details of an observation are most common when a witness is asked to prepare a statement of observation without the benefit of reminders in specific areas, such as speed, engine sound, vehicles involved, weather, etc.

7.7.3.6. Repression -- in the factors affecting witness quality mentioned above, it was noted that memory is enhanced by personal involvement, but degraded by stress or trauma. Participants in a mishap sequence who sustain a frightening or traumatic experience often have difficulty recalling even the most vivid events, despite their personal presence. This may be a result of the natural tendency of the mind to dispel or push unpleasant thoughts back into the subconscious as a protection from uncomfortable and upsetting memories.

7.7.3.7. Media coverage -- information presented via the media may taint interviewees' perceptions. It may also increase desire to be part of a "high profile" event.

7.7.4. Credibility. Bear in mind that witness testimony is sensitive to how it is interpreted; a witness' ambiguous answers may be interpreted by investigators in accordance with the investigators' own beliefs, opinions, or preconceptions. Be sure to differentiate between what the witnesses say and how you interpret their testimony. Certain aspects of human nature come into play when a person witnesses, or is part of, a dramatic event:

7.7.4.1. Witnesses rarely observe all of an occurrence, and even if they do, the tendency is to report those events that were most vivid.

7.7.4.2. Witnesses, when questioned in detail, become aware of gaps in their observations and, in hope of saving face, apply logic, answer in generalities, and add to their statements to make their observations seem more plausible.

7.7.4.3. Witnesses who offer very specific information about altitude, airspeeds, or maneuvers must be viewed with caution, since even eyewitnesses with aeronautical experience have difficulty with these estimates.

7.7.5. Reconciliation and Corroboration. Multiple, mutually corroborating witnesses greatly aid in resolving ambiguities. When witness statements are numerous, complex, or contradictory, they can be more objectively examined by preparing a matrix, with witnesses listed on one axis, and information provided on the other. Associating multiple witnesses with the information they have provided allows a check on their credibility against others that provided similar (or conflicting) information. This method has the added virtue of allowing investigators to examine the frequency with which a given item of testimony recurs (configuration, location, etc.).

7.8. Verbatim Testimony:

7.8.1. Verbatim testimony -- testimony appearing in the report as a transcript of questions and answers -- is most useful when taken in a formal interview from a direct participant in the mishap sequence. However, it should be used judiciously. It's much easier to conduct an interview than it is to transcribe the results; as a rule-of-thumb, expect your admin staff to need 7 hours worth of transcribing and typing for each hour of testimony. This is a "best case" estimate, assuming the transcriber understands the technical jargon used, and includes review by SIB members and corrections. Reviews must be made while listening to the audiotape or watching the videotape of the interview. Experience shows that three reviews by different SIB members are usually required before the final product is accurate. If the transcriber does not know the jargon, there will be more mistakes and the time can easily increase to 12 hours of work for each hour of interview. It is extremely important to keep interviews on line and avoid needless repetition. Another way to reduce the hours spent making corrections is to ensure that the person who conducted the interview also perform the first review of the transcript.

7.8.2. Verbatim testimony that simply repeats information provided in a written statement generally adds little to a report. However, if verbatim testimony is considered necessary to expand upon or further explain some aspect of written testimony, it should be kept focused. For an effective session, the interviewer should read the previous statements and develop specific questions. If that is not possible, an interview, particularly with verbatim testimony, is probably premature.

7.8.3. Verbatim testimony is subject to two common transcription problems:

7.8.3.1. Inadequate identification of questioners and interviewees -- the average typed transcription lists the witness name when first introduced and nothing but a bunch of "Qs" and "As" afterwards. When the transcripts are reproduced, they're easily mixed up and hard to restore to the correct order. Have the typist use last names or acronyms for the person's title, i.e. IO for investigating officer, MP for mishap pilot, etc. The AFSC representative will provide guidance as to usual abbreviations and acronyms used for mishap reports and messages.

7.8.3.2. Garbles in transcription -- typically, these have resulted from transcribing typists being unfamiliar with the terminology used during the interview; more recently, many have been the result of "autocorrection" and spell-checking associated with word processing programs. Read transcripts carefully and correct all such problems before going to press with the formal report. If a statement is truly garbled write <<garbled>> in the text.

7.9. Typical Problems Associated with Witness Testimony:

7.9.1. "The witness didn't sign the statement and has left town." As far as the safety investigation is concerned, a witness's signature doesn't contribute anything and is not necessary.

7.9.2. "The witness wrote out the statement before being advised of the purpose of the investigation or how their testimony will be used." Advise the witness after the fact; this also provides an opportunity to ask if he or she has anything to add to their initial statement.

7.9.3. "The witness wrote the statement on plain paper instead of the approved witness form and left town." When arguing in court against releasing witness statements, it is helpful to have had them sign on the form specified in AFI 91-204, Figure 2.3. However, this is not always practical, particularly in the case of a transient civilian witness, and the law recognizes this. As long as the report as a whole demonstrates a consistent effort to conform to the policy of advising witnesses on non-release of their statements, the occasional exception isn't a hindrance.

7.9.4. "The witness wants to give the same statement to the AIB." The witness can tell anyone anything; however, the SIB does not release the witness statement. Do not give the witness a copy of their statement for this purpose, either; they'll just have to tell the same story twice.

7.9.5. "There are 100 witnesses, and they all say the same thing." Select a representative statement, and use it. Keep a list of the names of all witnesses to give to the AIB. They make their own decisions on who to talk to and which statements to use.

7.9.6. "The witness made a statement to an investigator, but we were unable to get it taped, copied verbatim, or in writing." Have the investigator who interviewed the witness prepare a statement on what was said, but indicate it is not verbatim.

7.9.7. Where does non-privileged witness testimony get placed in the formal report? Because it is non-privileged, this type of testimony does not belong in Part Two, so it is placed in Part One, Tab O:

Any Additional Substantiating Data or Reports. If the testimony does not provide any insight into the mishap, don't include it in the report, but pass it on to the AIB under separate cover.

Figure 7.1. Witness Management Log for a Series of Written Statements(Example).

MISHAP PARTICIPANT/WITNESS MANAGEMENT LOG (NON-PRIVILEGED)

1. I, (Name of Witness as filled in the table below) have been advised by (Name of Investigator) of the following:
- a. This investigation is being conducted under the provisions of AF1 91-204 solely for the purpose of mishap prevention within the United States Air Force and to determine all factors relating to the mishap in order to prevent recurrence. I understand that I am a witness in a mishap investigation and I acknowledge that a promise of confidentiality has not been extended to me or my written statement.
 - b. This witness statement may be released to the public pursuant to a Freedom of Information Act request.
 - c. The chain of command will review the final mishap report.

Name (Last, First, MI)	Address (Organizational or Home)	Phone (Duty or Home)	Date First Interviewed	CM	OP	OB	Other	Statement	Taped Test.	Summary

Key:
"CM" = crewmembers
"OP" = other personnel listed as "directly involved" on AF Form 711
"OB" = observer/bystander
"OTHER" = self-explanatory. May include media, expert witnesses, uninvolved air traffic controllers, etc.
Statement = Written statement provided
Taped Test. = Testimony was taped
Summary = Interviewer has taken notes and summarized verbal testimony.

WITNESS LOG FOR AFI 51-503 ACCIDENT INVESTIGATORS[illegible]

Chapter 8

PREPARING MESSAGES AND FORMAL SAFETY INVESTIGATION REPORTS

Section 8A—Message Reports

8.1. Introduction. The purpose of an investigation is to prevent future similar mishaps. The SIB works long and hard to discover causes and make recommendations. The only way mishaps can result in corrective action is through the written records of the investigation--the messages and formal report. Consequently, the quality of these items is of major concern.

8.2. The Message is the Medium. Most of the Air Force relies on messages to tell them why a mishap happened and what is being done to prevent recurrence. Therefore, it is in the best interests of the ISB and SIB to generate a complete and accurate picture through message traffic for two principle reasons:

8.2.1. Everyone wants (and usually needs) the information you have. If you write sketchy or uninformative messages, you will be constantly barraged with requests for amplification, clarification, or updates; this makes it difficult to concentrate on investigating.

8.2.2. Everyone equates the effectiveness of a SIB with the quality of its message traffic. If the SIB sends clear, concise, and sound messages, it presents a picture of efficiency and quality. Conversely, messages that are opaque or uncommunicative suggest a board in disarray, or one "with something to hide."

8.3. Types of Messages Typically Associated with Safety Investigations:

8.3.1. Operational Report (OPREP)-3. This is the responsibility of the command and control system, but can present some pitfalls for the unwary. Check with the command post for a copy. Ensure OPREP 3 reports do not contain privileged information if assisting in preparation

8.3.2. Preliminary Report (8-hour). This is a fully releasable message report that's the first one that usually goes out through safety channels, and the ISB usually sends it out even before SIB members are notified. Get a copy of this message and review it. Correct any errors of fact in the status (72-hour) report (see below). In some cases, inappropriate or privileged material is inadvertently included in preliminary messages. In these instances, it is best to issue a corrected version, rescinding the original and directing its destruction.

8.3.3. Status Report. There are three types of status reports:

8.3.3.1. The first status report is transmitted 72 hours after the mishap, and is normally the first privileged safety message issued on the mishap. In addition to relaying new information and correcting previous errors, this message may identify SIB members, provide mishap crewmember flying hour history, and provide details on the mishap aircraft. If fatalities are involved, their names may be included in this message only if next-of-kin (NOK) notification has been completed. The most common error associated with the first status report is a failure to revise the message addressee list from the 8-hour message's list.

8.3.3.2. A status report must be sent at the 15-day point of the investigation to relay new status of the mishap investigation and any new information discovered since the 72-hour status report. Use the message format in 91-204, Chapter 7.

8.3.3.3. Other status reports may be issued to update the chain of command and other operators of the involved weapon system, as required. Status reports may be sent at any time to update information prior to the final report when awaiting results from Deficiency Reports (DR), Toxicological (TOX) testing, etc. Findings, causes and recommendations may be made in status reports if the investigator believes enough information is available to reach a conclusion when a delay is anticipated in receiving DR or TOX testing results.

8.3.4. Final Report. This is the single most important message the SIB produces. It is, in effect, an executive summary of the formal report in message form, and represents the permanent SIB's conclusions, findings, and recommendations. For most of the Air Force, the final report message is the report that will receive the widest dissemination, so it must stand on its own content. The final report message will not be released until after the briefing to the convening authority. A MAJCOM addendum may be appended to the board's message at command option. Pre-release review of a final report should address the following areas:

8.3.4.1. Adequacy of Content. Did the SIB include sufficient data from the investigation and analyses to support the conclusions?

8.3.4.2. Findings. Do they represent the conclusions of the SIB? Are they consistent with the findings presented in the message? Are they presented chronologically, with logical transitions, and include both the launch of the mishap sortie and the final disposition of both the aircraft and its occupants? Are the findings supported in the narrative portion of the report?

8.3.4.3. Causes. Do findings identified as "cause" start or sustain the sequence, or do they describe an expected consequence of the previous cause? Has the appropriate category-agent-reason (CAR) taxonomy been provided with each causal finding?

8.3.4.4. Recommendations. Are they relevant to the mishap? Do they address identified deficiencies? Are they specific, feasible, and cost effective? Are the action agencies appropriate?

Section 8B—The Formal Safety Report

8.4. Philosophy. Safety investigations take a lot of time and effort on the part of many individuals. This effort is wasted if the formal report is inadequate due to mismanagement, incomplete documentation, poor presentation, or poorly expressed analysis. In addition, formal report production is a burdensome task, but one that can be made much easier if the permanent board immediately establishes strict habits of document handling.

8.5. Organizing for Reporting. The checklist and indexes, AF Forms 711H, 711I, and 711J, ([Figure 8.1](#), [Figure 8.2](#), and [Figure 8.3](#).) show the expected contents and general layout of the formal report. In addition to offering a ready-made organizational system for board members to file information as it is collected, the tab structure itself represents an excellent means of dividing the labor associated with formal report preparation.

8.5.1. Systematic Filing of Documentary and Testimonial Evidence. One of the first actions the recorder takes is to establish a file system for the board. File folders, especially accordion-style folders, are an excellent organizational aid for individual and aircraft records. Set up a file system that everyone understands and can readily use. Start a new folder as evidence comes in which needs to be filed. Ensure that a master index is on the front of the filing cabinet with two columns. The first col-

umn will be the file number, the second will state the content of the folders. In the first couple of days of the SIB, consider setting up the following:

- 8.5.1.1. At least one folder per formal report tab.
- 8.5.1.2. At least one folder for each participant in the mishap.
- 8.5.1.3. At least one folder for each witness' transcribed testimony.
- 8.5.1.4. At least one folder for each member of the board.
- 8.5.1.5. At least one full file drawer for each board member (two for the investigating officer and medical member).
- 8.5.1.6. At least one freestanding cabinet with shelves (if physical evidence is to be stored in the workcenter).

NOTE: If the workcenter itself cannot be fully secured at night for any reason, ensure all file and evidence cabinets can be locked.

8.5.2. Incremental Preparation of the Formal Report. Typical formal reports for Class A flight mishaps take up one, and sometimes two 3-inch binders. They contain a wealth of carefully selected information, both factual and analytical. However, anywhere between 30 to 60 percent of a formal report's actual contents may be collected within the first week after the mishap. Looking at it another way, ISB members begin collecting information that will be needed for the formal report the same day the mishap occurs. The SIB must start building the formal report virtually the minute they arrive, unless they want to be faced with a virtually impossible task at the end of their investigation. SIB presidents can minimize the headaches associated with report preparation up front by following two simple management guidelines:

- 8.5.2.1. Assign responsibility for each tab to a specific individual the first day you're on station.
- 8.5.2.2. Establish milestones for completion of specific tabs. It is helpful for everyone to see progress toward completion of the investigation. A list of tabs and their status, posted prominently in the workcenter, helps keep the entire board focused on their goal. [Figure 8.4.](#) shows one method of depicting tab assignments and the time that should be budgeted for each, as well as desired completion dates. Ensure that all SIB members review all Tabs for accuracy and consistency prior to finalization. As tabs are completed, have the recorder reproduce them in quantity (usually 20 to 25 copies will suffice), set them aside, and mark the tab as "complete" on the chart. The choice of specific management tools for organizing the information gathered through the investigative process is entirely up to the SIB. The key point to remember is to establish a system immediately so that the final product is uniform, accurate, and complete.

8.6. Assembling the Formal Report:

8.6.1. Format and Cover Page:

- 8.6.1.1. The Air Force standard for all written products is 8 1/2 by 11-inch format, typed on both sides, with a 1.5-inch margin. Air Force formal safety reports are prepared in this size and bound in three-ring binders of the appropriate size. For bulky two part reports, place Part I and Part II in separate binders.

8.6.1.2. Use Times New Roman, 12 point, for text documents. Vary the font size as needed for the 711 Series Forms. Type/print on both sides of 8.5 by 11 inch paper.

8.6.1.3. Under Page Set-Up in Microsoft Word (for other word processing programs follow the intent of these guidelines):

8.6.1.3.1. Set Top and Bottom margins to one inch.

8.6.1.3.2. Select "Mirror Margins" and set "inside" to 1.0 inch, "outside" to 1.0 inch. Set "gutter" to zero. (If you do not have a duplex printer, this will set the margins correctly for front-back reproduction. If you have a duplex printer this is the same as setting the left margin to 1.0 inch and deselecting "Mirror Margins").

8.6.1.3.3. Set header margin to .5 inches and ensure the following appears on each page of the report in the header block (Italicized and 10 pitch): "Aircraft Type, Aircraft Serial Number, date (YYYYMMDD) and mishap control number" (e.g. *F-15C, 85-0001, 19970516QKKA508A*). Note that the local Wing Safety Office designates the mishap control number and this number should be the same as that found on the 8-hour message. Type it in 10 point Times New Roman, italicized and center it.

8.6.1.3.4. Arrange the tabs in alphabetical order, with Tab A on top. Number all pages in order within the tab. Center page numbers at the bottom of each page. Check all the page numbers throughout the report to be sure there are no pages missing. Pages should be numbered consecutively through each tab. Example: Numbering should be J-1, J-2, J-3, etc. or U-1, U-2, U-3, etc. NUMBERING should not be: U-1-2, U-1-3, U-2-1, or U.1.1, U.1.2, etc. DO NOT use J-1, J-2, J-2b, J-2c, J-2d, etc. Number the page even if there is only one page in the Tab. If attachments are used, the pages should be numbered concurrently from the previous page. External reports, i.e. those from technical experts, contractors, laboratories, etc. may be numbered independently with an acronym for the report in the number. For example, Tab J's Egress Systems Analysis would be numbered J ñ ESA ñ 1/4, with 4 being the total number of pages in the report. The advantage of this type of numbering is that it permits the SIB to include the reports received without having to wait until they are all in before completing the Tab; only the index/title page must be updated. Give or e-mail anyone submitting a report the SIB's format. If possible, review an e-mailed electronic version for those agencies/individuals not at the SIB and have them courier the final signed copy to the SIB. DON'T use Atch 1, Atch 2, Atch 3, etc. When pages are not numbered, it is impossible to determine if there are pages missing or if the report is dropped and the pages spill out reassembly is tedious. If the backs of pages are not used, place the phrase "INTENTIONALLY LEFT BLANK" and number blank pages.

8.6.1.4. Use good quality D-ring type binders. These permit one half of the binder to lay flat and are much more convenient for inserting and reviewing material than conventional binders.

8.6.1.5. Use binders with covers that allow insertion of pages into the front and spine if possible. If these binders are unavailable, glue cover and spine labels directly onto each binder. Use the formats in [Figure 8.5](#). (cover) and [Figure 8.6](#). (spine) as guides to ensure all required information and caveats are properly included.

8.6.1.6. Crests and pictures/artwork of an aircraft of the same mission design series (MDS) as the mishap aircraft may be added to the front and/or spine covers at MAJCOM option. Any photographs used on the cover must be non-privileged and should not include people.

8.6.1.7. In addition to the standard warning required by AFI 91-204, include the following statement: "Copying or releasing any portion of this document is prohibited without the express written permission of the Air Force Chief of Safety." on the front and spine covers

8.6.1.8. Marking Part I and Part II: Part I of a privileged formal report contains factual information only and is fully releasable. Do not place markings on unclassified pages in Part I of two part formal reports indicating special handling requirements, for example "For Official Use Only." Place a footer on each page in Part II of privileged safety reports containing the following statement:

FOR OFFICIAL USE ONLY.

THIS CONTAINS PRIVILEGED SAFETY INFORMATION. UNAUTHORIZED USE OR DISCLOSURE CAN SUBJECT YOU TO CRIMINAL PROSECUTION, TERMINATION OF EMPLOYMENT, CIVIL LIABILITY, OR OTHER ADVERSE ACTIONS. SEE AFI 91-204, CHAPTER 2 FOR RESTRICTIONS. DESTROY IN ACCORDANCE WITH AFMAN 37-139 WHEN NO LONGER NEEDED FOR MISHAP PREVENTION PURPOSES.

8.6.2. Before Part 1 in the formal report.

8.6.2.1. Letter of Transmittal. Follow the format in AFI 91-204, Figure 5.2. The last paragraph of the letter of transmittal, must contain a statement certifying the copies of the report listed are the only copies the SIB produced. Check the distribution of reports with AFI 91-204, Table 7.4. Comply with the following:

8.6.2.1.1. HQ AFSC must receive 3 copies of the report.

8.6.2.1.2. Be sure all agencies tasked for action in the recommendations, are listed to receive a copy of the formal report.

8.6.2.1.3. Reports should be sent to the MAJCOM/SE unless indicated different in the AFI 91-204, Table 7.4. Reports should not be sent to MAJCOM/DO or Numbered AF/DO. The safety offices should receive the reports so privileged material can be properly controlled.

8.6.2.1.4. Formal safety reports distributed within the Air Force on a "need -to-know" basis using AFI 91-204, Table 7.4. Do not produce extra copies except as indicated.

8.6.2.1.5. When the aircraft, facilities, materiel, or personnel of another US military service are involved in an AF mishap that service Navy or Army an extra copy of the formal report should be sent to HQ AFSC/JA for release to that agency

8.6.2.2. As a technique when the AIB follows the SIB, include the following behind the letter of transmittal in the first three copies of the report, the MAJCOM/SE copy, and part 1 going to the AIB president:

8.6.2.2.1. An inventory of material turned over to the AIB.

8.6.2.2.2. A witness list provided to the AIB.

8.6.2.2.3. An inventory of all aircraft parts and their current status including items still at labs for analysis.

8.6.3. Part I (Non-Privileged) Tabs:

8.6.3.1. Tab A, AF Form 711, USAF Mishap Report (**Figure 8.7.**). The Air Force is required to disclose this form under the Freedom of Information Act unless it contains classified information. It contains a factual summary of the mishap, which must not use privileged sources (witness statements, technical evaluations by contractors, etc.) or any part of the SIB's investigation, analysis, conclusions, findings, and recommendations.

8.6.3.1.1. Check item 4, Place of Occurrence. Give the location of the mishap and not where trouble first developed. Give distance NM or SM and direction. Also give latitude and longitude.

8.6.3.1.2. Check item 10. List of Personnel Directly Involved. List the information for each military person or civilian employee in the Federal Service involved in the mishap. Include all persons injured on the ground also.

8.6.3.1.3. Item 11: FACTUAL SUMMARY: Must be completely factual, i.e. do not include any information from Part II. The factual summary of circumstances must lead the reader through the sequence of events involved in the mishap. Check the narrative to insure it does not contain privileged material such as witness statements or reference to witness statements. Example: "The pilot heard a loud bang..." or "The engine flamed out, and the pilot followed the checklist thoroughly while making three attempts to restart the engine before ejecting." Look for comments that could only be known by asking the pilot and using his testimony. NOTE: If the comments were spoken on the radio, they cannot be protected with privilege and can be included in the narrative, but this must be verified by the transcribed radio communications in Tab N.

8.6.3.1.4. See AFI 91-204, Attachment 3. The **investigating officer** normally completes this form.

8.6.3.2. Tab B, Preliminary Message Report. A copy of the 8-hour message as it went out, i.e. do not correct any errors.

8.6.3.3. Tab C, AF Form 711B, Aircraft Flight Mishap Report (**Figure 8.8.**). Use one form for each aircraft involved. See AFI 91-204, Attachment 3. The **pilot member** normally completes this form.

8.6.3.4. Tab D, AF Form 711C, Aircraft Maintenance and Materiel Report. Use one form for each aircraft involved. See AFI 91-204, Attachment 3. The **maintenance member** normally completes this form.

8.6.3.5. Tab G, Flight and Personnel Records. Include copies of the AFORMS printout for each crewmember, showing their most recent flight experience. Flying times should be closed out as of the date of the mishap (**do not** include mishap flight time). Include FP/IP time, total flight time, 30/60/90 totals, etc. Include training or personnel records if they provide supporting documentation related to the investigation. See AFI 91-204, Attachment 3. The **pilot member** normally assembles materials for this tab.

8.6.3.6. Tab H, AFTO Form 781, Aerospace Vehicle Flight Data. Include a copy of appropriate AFTO Forms 781s only if they add to the report. Forms may be retyped for readability; if this is done, label the retyped forms "retyped for readability." Original aircraft forms are provided to the AIB. See AFI 91-204, Attachment 3. The **maintenance member** normally completes this tab.

8.6.3.7. Tab I, Product Quality Deficiency Report (PQDR). If the SIB submitted any PQDRs, include a copy of each at this tab. Do not include privileged information in PQDR narratives. If the responses to PQDRs include privileged information, or make statements to the effect that “the failure was caused by...”, sanitize them IAW AFI 91-204 and include a copy of the unsanitized version at the back of Tab T (see below). See AFI 91-204, Attachment 3. The **maintenance member** normally completes this tab.

8.6.3.8. Tab J, Technical and Engineering Evaluations of Materiel: If a DOD agency or employee (military or DOD civilian) or a contractor who did not build, design, or maintain the equipment completed a TDR or an engineering evaluation, include it here. On-scene evaluations of wreckage or components performed by DOD personnel (such as AFMC and HQ AFSC) are included at this tab. TDRs that are not finished in time and are to be included in the report shall be annotated on AF Form 711H (Index) form appropriately to indicate their absence. **NOTE:** When the SIB requests analysis at the ALC or contractor facility, provide disposition instructions for the component after completion of analysis. Normally, the component should be returned and placed with the rest of the wreckage. Use the following guidelines:

8.6.3.8.1. Some technicians from the ALC will write, “The purpose of this investigation is to determine the cause of the mishap.” That is incorrect. ALCs purpose is to determine what parts are bent, broken, or burned; whether it happened before, during, or after the mishap; and how, etc. The mishap investigation board will determine what caused the mishap, and that will not appear in Part I.

8.6.3.8.2. Some technicians will say, “We were asked by the SIB president or investigation officer to determine if ...” This reveals deliberative process and is privileged.

8.6.3.8.3. Often in the first paragraph the writer gives a brief description of the mishap and includes comments he has heard from board members and/or the mishap crew. Witness statements or reference to witness statements should not appear in Part I.

8.6.3.8.4. Flag-words like “CAUSE” sometimes appear, often in the last paragraph under conclusions. The technician should not speculate on the cause of the mishap. Within his area of expertise, he can speculate as to the cause of a part or component being bent, broken, or burned. But the technician must not make statements that certain systems or parts, “did or did not cause the mishap.” Technician comments regarding the cause of the mishap should be prepared on a separate paper and given to the mishap board. If the comments are valid, they will appear in Part II.

8.6.3.8.5. Technical specialists should write their reports in the form described in AFI 91-204, Figure 4.1.

8.6.3.8.6. The **maintenance member** normally completes this tab.

8.6.3.9. Tab K, Military Flight Plan or Authorized Substitute Flight Plan Forms. See AFI 91-204, Attachment 3. The **pilot member** normally completes this tab.

8.6.3.10. Tab L, DD Form 365-4, Weight and Balance Clearance Form F. Include a copy of the most recent DD Form 365-4 or weight and balance computations for the flight involved. If reaccomplished for readability, state this on the recreated form. If the investigators computed the form, then include a copy in Part II, Tab T, since this is an estimate or judgment by the investigators. Regardless of whether or not weight and balance are considered likely factors in the mishap, it is

good technique to calculate aircraft gross weight and center of gravity (CG) at the time the flight mishap occurred. Include this information in the Tab T narrative. See AFI 91-204, Attachment 3. The **pilot member or maintenance member** normally completes this tab.

8.6.3.11. Tab M, Certificate of Damage. This lists the total damage to all government property, materiel, and equipment. Include the maintenance officer's detailed evaluation, statement of damage, cost of parts replaced, and man-hours required for repair. See AFI 91-204, Attachment 3. The **maintenance member** normally completes this tab.

8.6.3.12. Tab N, Transcripts of Recorded Communications. These are written transcripts of recorded voice communications. **NOTE:** Since transcripts are factual data, they often provide framework upon which the "Summary of Circumstances" required in Tab A may be built. In aircraft where voice communications are recorded on a Head Up Display, radar display or other videotape, all internal and external transmissions are captured and should therefore be transcribed. Differentiate between inter and intra cockpit communications and between inter and intra flight transmissions, i.e. identify all of the players talking. There is no need to separately transcribe different tapes from the same aircraft if they contain the same recorded information. There is usually no need to transcribe anything more than a lead in to the mishap sequence, the mishap sequence and the initial post-mishap actions, i.e. Control Tower or ATC crash response, Search and Rescue Civil Air Patrol, etc. In the case where a problem may have been discussed or noted well before the mishap sequence due to the capture of a radio transmission or warning tones, the transcription should begin at a point prior. If problems, inconsistencies or unusual circumstances occur during crash response or search and rescue and are captured on tape, these should also be transcribed and included. Tab N should not contain transcriptions where the mishap investigation board members have made additions to indicate the aircraft's position at various times, or what was happening in the cockpit at various times, etc. That kind of reconstruction by the mishap board should be in Tab T. See AFI 91-204, Attachment 3. The **investigating officer** normally assembles materials for this tab.

8.6.3.13. Tab O, Any Additional Substantiating Data Reports. This is supporting data not otherwise defined. It may include local operating instructions, directives, approach and landing charts, enroute charts, flight data recorder information, or other forms. Statistical data is included in this tab as necessary. If it is necessary to include transcripts of non-privileged testimony, they will be included in Tab O. Care must be exercised not to include privileged materials at this tab; however, Tab T's narrative and analysis may refer to factual information in this tab as necessary. Many of the reports have a printout of the binary codes of data from the aircraft systems. This can go in Tab O, but if the data is analyzed by the contractor, the analysis should be placed in Tab T, and should not be released to the AIB. See AFI 91-204, Attachment 3. The **investigating officer** normally completes this tab.

8.6.3.14. Tab P, Statement of Damage to Private Property. If the mishap damages private property, describe the damage at this tab. Under no circumstances should an estimate of the dollar amount of damages be stated in this tab. See AFI 91-204, Attachment 3. The **investigating officer** normally completes this tab.

8.6.3.15. Tab Q, Orders Appointing SIB. Include one copy of the orders appointing the SIB (or single investigating officer). See AFI 91-204, Attachment 3. The **recorder** normally completes this tab.

8.6.3.16. Tab R, Diagrams: Use diagrams only if they add to the understanding of the report. Diagrams can be both powerful investigative and explanatory tools if prepared properly. Those that relate elapsed time to actions, events, or movements are particularly effective. However, diagrams placed in Tab R must be based entirely on factual information. Sometimes an aerial photograph of wreckage and burn patterns conveys desired information better than a diagram (this type of photograph would be placed in Tab S). SIBs must be careful not to perform analysis in constructing diagrams; otherwise they become privileged and must be placed in Tab T. See AFI 91-204, Attachment 3. The **investigating officer** normally completes this tab.

8.6.3.17. Tab S, Photographs. Well-defined photographs help in mishap analysis. Number all pages containing photographs (S-1, S-2, etc.). Place an index of photographs at Tab S to aid reviewers. Do not mark on the photographs themselves. Photographs need to “stand alone” with only a title on the page, no other markings or descriptions. Ensure that in the title you reference which direction the photograph is facing, i.e. “Debris field looking to the west.” If it is impossible to describe a point of interest on a photograph with a caption, use circles or arrows on a transparent overlay.” and place in Tab T. Marked photographs go in Tab T. Photos showing a comparison between a broken part from the mishap aircraft and a new part or a part from another aircraft should be placed in Tab T. See AFI 91-204, Attachment 3. The **investigating officer** normally completes this tab.

8.6.4. Part II (Privileged) Tabs:

8.6.4.1. Tab T, Investigation, Analysis, Findings and Recommendations. This tab is the most important part of the report and is the responsibility of all SIB members. Place all privileged status reports and the final consolidated mishap report (CMR) in this section.

8.6.4.1.1. The layout of Tab T should be as described in AFI 91-204, Attachment 3:

8.6.4.1.1.1. Executive Summary - Provide a condensed version of the mishap report that encapsulates the mishap sequence, analysis, and the SIB's primary findings, causes and recommendations. This should be no more than five pages in length.

8.6.4.1.1.1.1. Mishap Sequence

8.6.4.1.1.1.2. Investigation and Analysis

8.6.4.1.1.2. Findings

8.6.4.1.1.3. Recommendations

8.6.4.1.1.4. Other Findings and Recommendations of Significance

8.6.4.1.1.5. Authentication Page

8.6.4.1.1.6. Minority Opinions (if required)

8.6.4.1.2. The principle model for the development of investigation and analysis portions of the Tab T is the traditional “history of flight/investigation and analysis/findings, causes, and recommendations” structure. Boards have wide latitude in selecting the presentation format that most clearly expresses the information they need to convey, but their objective is to clearly show:

8.6.4.1.2.1. Areas investigated.

8.6.4.1.2.2. Factors considered and rejected, with rationale.

8.6.4.1.2.3. Factors accepted, with rationale as to why they are considered most credible as appropriate.

8.6.4.1.3. Three conventions should be used in developing the specific language of Tab T:

8.6.4.1.3.1. Identifying Involved Personnel. Do not identify involved personnel by name or personal call sign in the narrative; instead, use such terms as “the mishap aircraft (MA),” “the mishap flight lead (MFL),” “mishap pilot 1 (MP1),” etc. This applies to both the narrative discussion and the findings and recommendations that appear at the end of the narrative.

8.6.4.1.3.2. Referring to Exhibits. When the report includes supporting documents (records, photos, statements, technical reports, etc.), refer to the tabs and page numbers of the exhibits; this eliminates the need to repeat in the narrative word for word from other parts of the report.

8.6.4.1.3.3. Labeling of Findings and Recommendations: Findings and recommendations are numbered consecutively, preceded with the word “Finding” or “Recommendation” as appropriate; causal findings are further identified with the word “CAUSE” immediately after the number.

8.6.4.1.4. Boards need to pay particular attention to four critical aspects of Tab T: assessment of possible mishap factors, development of concise findings, assignment of “cause” at the critical points in the mishap sequence, and promulgation of well-considered recommendations to prevent recurrence.

8.6.4.1.4.1. Mishap Factors:

8.6.4.1.4.1.1. A “factor” is any unusual, out-of-the-ordinary, or deficient action or condition discovered in the course of a mishap investigation, which in the board’s opinion contributed to the eventual outcome, or is indicative of a pattern of less than adequate decisions or conditions that recurs throughout the investigation.

8.6.4.1.4.1.2. Factors may be either “causal” (see below) or noncausal actions or conditions. Examples of noncausal conditions which could be considered factors:

8.6.4.1.4.1.2.1. Unit leadership failed to correct breaches of flight discipline by unit personnel other than the mishap pilot, leading the pilot to attempt an unauthorized maneuver. (“Unit supervision was a factor in the mishap.”)

8.6.4.1.4.1.2.2. Deteriorating weather conditions resulted in a rushed, inadequate preflight, and the mishap flight engineer failed to ensure an engine cowling was properly secured. (“Weather was a factor in the mishap.”)

8.6.4.1.4.1.2.3. Mishap crewmembers’ sleep was interrupted several times during the night by a loud party, and that their subsequent poor performance could be at least partially attributable to fatigue. (“Inadequate billeting and crew rest were factors in the mishap.”)

8.6.4.1.4.2. Findings (See AFI 91-204, Chapter 5):

8.6.4.1.4.2.1. The objective of presenting findings systematically is to identify correctable events in the sequence; in some cases the chain of events may begin with

design deficiencies or improperly written directives prepared long before the actual mishap sequence. The key is Design/TCTO/Regulations/Training/Mishap. That is the order aircraft are designed and fielded. Many times SIBs have a tendency to put guidance first, or training and then design. The correct order is; first the design, then the TOIs, then regulatory guidance, which results in the training plan and then the mishap.

8.6.4.1.4.2.2. Each finding developed by the SIB must have a logical connection to a preceding finding. If no logical relationship exists, the SIB has not yet correctly described the mishap sequence.

8.6.4.1.4.2.3. After developing the findings, the following 7 step “Findings Test” can be applied to validate

8.6.4.1.4.2.3.1. Is it related to the specific, brief event?

8.6.4.1.4.2.3.2. Is it a correctable event in the sequence?

8.6.4.1.4.2.3.3. Is it a single event or condition?

8.6.4.1.4.2.3.4. Is it specific enough without including supporting evidence?

8.6.4.1.4.2.3.5. Does it logically connect to the preceding finding?

8.6.4.1.4.2.3.6. Is it really relevant or simply interesting to the reader?

8.6.4.1.4.2.3.7. Is it simply a possible alternative existing merely because it can't be eliminated?

8.6.4.1.4.3. Causes (See AFI 91-204, Chapter 5):

8.6.4.1.4.3.1. Causes (or “causal findings”) are those findings that singly or in combination with other causes resulted in the damage or injury that occurred. They may be:

8.6.4.1.4.3.1.1. Deficiencies or decisions, which if corrected, eliminated, or avoided would likely have prevented or mitigated the mishap damage or significant injuries.

8.6.4.1.4.3.1.2. Acts, omissions, conditions, or circumstances that either start or sustain the mishap sequence.

8.6.4.1.4.3.1.3. An element of human or mechanical performance.

8.6.4.1.4.3.1.4. An environmental condition (if it was not reasonably avoidable).

8.6.4.1.4.3.2. After determining the causal findings, the following “Cause Test” can be applied to check their validity:

8.6.4.1.4.3.2.1. Most are correctable by commanders, supervisors or individuals.

8.6.4.1.4.3.2.2. Is it a clear and simple statement of a single condition or event?

8.6.4.1.4.3.2.3. Is it in the active voice and follow the format: *Who did what to whom/what and why?*

8.6.4.1.4.3.2.4. If it is an effect or an expected result of a previously identified cause, even though it's inclusion sustains the mishap sequence, it is not causal.

8.6.4.1.4.3.2.5. Apply the reasonable person concept:

8.6.4.1.4.3.2.5.1. If the performance or judgment was reasonable considering the circumstances or training received, do not assign cause (although the deficient training may be causal).

8.6.4.1.4.3.2.5.2. Human limitations (physiological or psychological) may be causal even if they are reasonable.

8.6.4.1.4.3.2.5.3. Environmental conditions may be causal if they were not reasonably avoidable.

8.6.4.1.4.4. Recommendations (See AFI 91-204, Chapter 5):

8.6.4.1.4.4.1. Recommendations are actions that are intended to prevent recurrence of a similar mishap or reduce its effects. A recommendation says something was wrong that must be corrected. Every mishap investigation should include recommendations. However, **do not** include a recommendation just to have one. Ensure they are plausible and make sense. Sometimes a mishap investigation will not have any recommendations to make.

8.6.4.1.4.4.2. Boards must ensure their recommendations are feasible and are related to the causes of the damage, fatalities, or injuries or, alternately, are aimed at correcting deficiencies (factors) identified during their investigation.

8.6.4.1.4.4.3. If multiple, sequential actions must be accomplished by different agencies to fulfill the intent of a board's recommendation, express them as a series of recommendations rather than subgroupings (such as 1a, 1b, etc.) e.g.:

8.6.4.1.4.4.3.1. "Recommendation 1. Perform a study of cumulative fatigue among unaugmented mobility crews; provide the results of this study to Air Mobility Command for consideration. OPR: HQ AFMC (HSC)."

8.6.4.1.4.4.3.2. "Recommendation 2. Review the HSC study of cumulative fatigue and determine if mission scheduling needs to be adjusted. OPR: HQ AMC/DO; OCR: AMC-TACC."

8.6.4.1.4.4.4. When making recommended changes to publications, closely follow the guidance in AFI 91-204, Chapter 5.

8.6.4.1.4.5. Other Findings and Recommendations of Significance (See AFI 91-204, Chapter 5):

8.6.4.1.4.5.1. Include findings developed during the investigation that are not part of the mishap sequence at the end of Tab T in the formal report. These findings may cover a wide variety of subjects, and their use, content and format are at the discretion of the SIB President. These are normally findings not related to the cause of the mishap but may prevent future mishaps. Other Findings of Significance (OFS) should be fully supported in the Tab T.

8.6.4.1.4.5.2. The SIB shall make Other Recommendations of Significance (ORS) related to the respective OFS uncovered during the investigation that they believe would mitigate or prevent future mishaps. Each OFS will be followed by an ORS.

8.6.4.1.4.5.3. OFS and ORS should be placed in the same section following the Primary Findings and Recommendations. Use a format of identifying the OFS followed by the appropriate ORS.

8.6.4.1.4.6. Authentication Page: Type each primary SIB member's name, grade, and position on the last page of the Tab T. Have each concurring member sign above it for authentication of the report or for any changes to the report.

8.6.4.1.4.7. Minority Opinions: Primary members that disagree with the results of the investigation may submit minority reports. Minority reports must include reasons for disagreeing, and will include findings, causes and recommendations if different from those contained in the report. Sign the minority report and place immediately after the authentication page.

8.6.4.2. Tab U, Statements and Testimony of Witnesses and Persons Involved. Physical and documentary evidence are the most credible forms of evidence; however, the accounts of witnesses often provide important (and sometimes the only) leads as to the causes. Witnesses include those involved in the mishap, those who saw it, and those whose training and experience qualifies them as experts. All witness statements and testimony included in this tab must include the prescribed advisory language in paragraph 7.2.1. and AFI 91-204. Start Tab U with a table of contents listing all testimony by witness name. Place the testimony of each individual together in chronological order with the earliest on top. Be very careful when summarizing testimony as it detracts from the results of the investigation if the investigator edits comments from witnesses in order to correspond with the results of the investigation. Include ALL statements and testimony from mishap participants. Pages are numbered consecutively (U-1, U-2, etc.). Numbering is not restarted for each witness. Each interview should start on an odd page and end on an even-numbered page; add a blank page with "INTENTIONALLY LEFT BLANK" on the last even-numbered page of the interview if it ends on an odd-numbered page. See AFI 91-204, Attachment 3. It is not uncommon for this tab to have 200 plus pages. The **investigating officer** normally completes this tab.

8.6.4.3. Tab V, Statements of Persons Cited in Findings. When a USAF safety investigation report mentions a USAF individual in the findings, he or she is given an opportunity to submit a witness statement commenting on those findings. This statement is in addition to any other witness statements or testimony provided by the individual. Each individual cited in findings is provided an advisory letter (see AFI 91-204, Chap 5) notifying them of this fact and inviting them to submit a statement. A copy of each such memo is included in Tab V. Individuals will not be notified until after the SIB out briefs the convening authority and the final message and formal report are distributed. Annotate AF Form 711H (Index) appropriately to indicate that an additional statement may be forthcoming for inclusion into Tab V. Once received by the Safety Office of the convening authority, any of these statements will be reproduced and distributed to the same offices and agencies that received the formal report for inclusion directly behind the associated advisory memorandum in Tab V. Refer to AFI 91-204 for the proper procedures to notify personnel found causal in Privileged Safety Investigation Reports. The **recorder** normally assembles inputs for this tab.

8.6.4.4. Tab W, Technical and Engineering Evaluations of Materiel. A letter of acknowledgment for protection of privileged data, signed by the contractor, should be included in this Tab. This Tab is not an appropriate place for reports from DOD personnel, ALCs, etc., unless they comment about the cause of the mishap. Normally these are included at Tab J; the privileged part must be deleted if this is the intended location. If the document contains only a word or sentence that is not

releasable, it is normally better to delete the word or sentence and place the document in part I. Sometimes a technician has prepared two reports, one for Part I, and one for Part II. See AFI 91-204, Attachment 3. The **maintenance officer** normally completes this tab.

8.6.4.5. Tab Y, Life Sciences Narrative and Report. Submit these forms and required narratives as described in AFI 91-204. See **paragraph A4.23.** for a suggested template. Tab Y should essentially be a stand alone report covering medical issues, human factors and life support issues and serves as a consultant report to Tab T. Findings and recommendations from this Tab may also be discussed and incorporated into appropriate sections of Tab T. Include these findings and recommendations from Tab Y into Tab T findings and recommendations only if they contribute to the mishap sequence. Download the electronic Life Science Report (LSR) from:

<http://www-afsc.saia.af.mil/AFSC/RDBMS/Flight/sefl/lifedown.html>. Check to make sure that there is a Life Sciences Report for each aircrew member involved in the mishap. Human factors and life support consultant reports should be attached to this Tab. Ensure that the last two physical examinations (the last PHA and the last long physical) are included for each individual in the AFSC copy of the report. The AFSC copy (copy #1) should also contain the results of all laboratory and X-ray studies. The **flight surgeon** and **life support member** normally complete this tab.

8.6.4.6. Tab Z, SIB Proceedings. Optional. SIBs may use this tab to tell reviewing agencies about investigation problems and to make recommendations for improving reporting and investigating procedures. Comments on technical assistance are also appropriate. The **board president** normally completes this tab.

Figure 8.1. USAF Mishap Report Checklist and Index (page 1).

TAB	USAF MISHAP REPORT CHECKLIST AND INDEX	Not Applicable	Applicable Not Complete	Attached
PART I - FACTS				
A	AF Form 711, USAF Mishap Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
B	Preliminary Message Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
C	AF Form 711B, Aircraft Flight Mishap Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
D	AF Form 711C, Aircraft Maintenance and Materiel Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
E	AF Form 711D	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
F	AF Form 711E	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
G	Flight and Personnel Records	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
H	AFTO Form 781 Series	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
I	Product Quality Deficiency Reports	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
J	Technical and Engineering Evaluations of Materiel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
K	DD Form 175, or Authorized Substitute Flight Plan Forms	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
L	DD Form 365-4, Form F - Weight and Balance Clearance	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
M	Certificate of Damage (<i>List of parts damaged</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
N	Transcripts of Recorded Communications	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
O	Any Additional Substantiating Data or Reports	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
P	Statement of Damage to Private Property	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Q	Orders Appointing Safety Investigation Board	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
R	Diagrams (<i>Fallout-impact area, etc.</i>)	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
S	Photographs	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
PART II - BOARD OR INVESTIGATOR ANALYSIS				
T	Investigation, Analysis, Findings and Recommendations	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
U	Statements and Testimony of Witnesses and Persons Involved	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
V	Statements of Persons Cited in Findings	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
W	Technical and Engineering Evaluations of Materiel	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
X	AF Form 711F, Nuclear Accident/Incident Report	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Y	AF Form 711GA, Life Sciences Report	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
Z	Safety Investigation Board Proceedings	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>
WHENEVER "APPLICABLE BUT NOT ATTACHED" COLUMN IS MARKED FOR ANY OF THE ABOVE ITEMS, INFORMATION MUST BE ENTERED UNDER REMARKS TO INDICATE WHAT ACTION HAS BEEN TAKEN OR WILL BE TAKEN TO OBTAIN THE REQUIRED ATTACHMENT. LETTERED TABS SHOWN ABOVE WILL BE INSERTED FOR CORRESPONDING ATTACHED ITEMS, I.E., TAB G WILL ALWAYS BE USED FOR INDIVIDUAL FLIGHT AND PERSONNEL RECORDS, TAB N FOR TRANSCRIPTS OF RECORDED COMMUNICATIONS. TABS WILL BE OMITTED ON THOSE ITEMS NOT APPLICABLE.				

AF FORM 711H

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Figure 8.1. Continued.

REMARKS

Figure 8.2. AF Form 711I (Tabs for Part I of Formal Report)

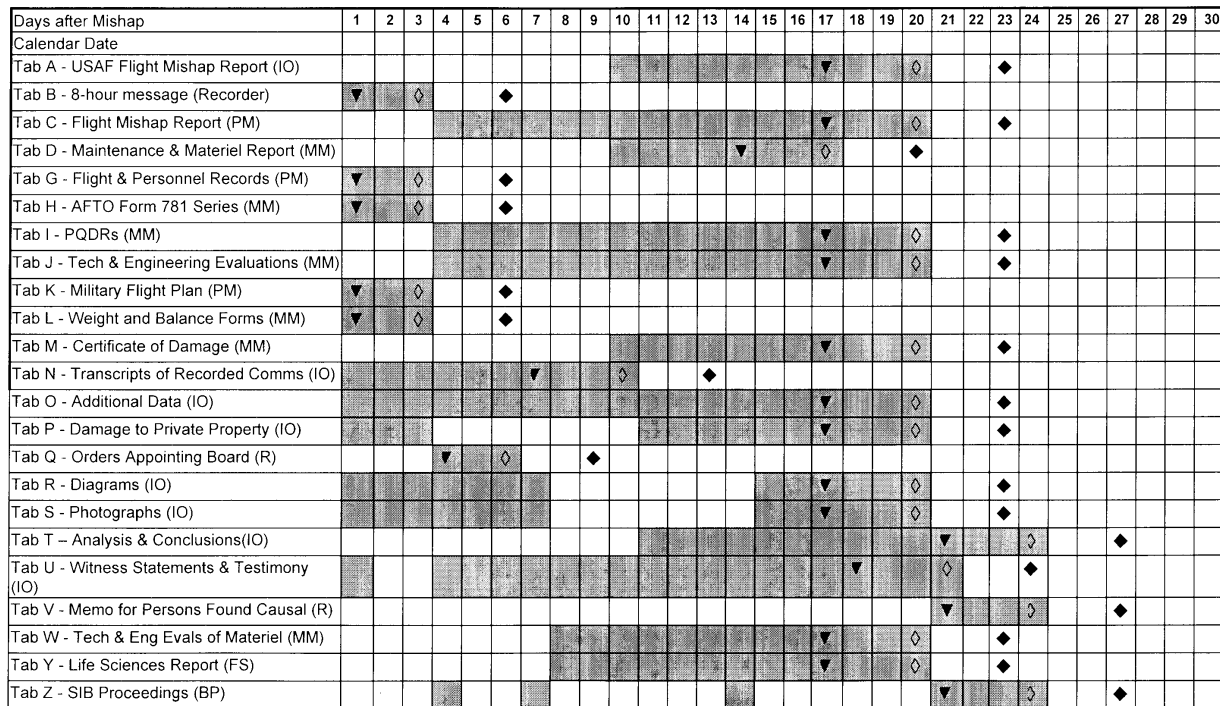
USAF MISHAP REPORT INDEX TAB PART ONE - FACTS

A	AF Form 711 - <i>USAF Mishap Report</i>
B	Preliminary Message Report
C	AF Form 711B - <i>Aircraft Flight Mishap Report</i>
D	AF Form 711C - <i>Aircraft Maintenance and Materiel Report</i>
G	Flight and Personnel Records
H	AFTO Form 781 Series
I	Product Quality Deficiency Reports (PQDR)
J	Technical and Engineering Evaluations of Materiel
K	DD Form 175, or Authorized Substitute Flight Plan Forms
L	DD Form 365-4 - <i>Weight and Balance Clearance Form F – Transport/Tactical</i>
M	Certificate of Damage
N	Transcripts of Recorded Communications
O	Any Additional Substantiating Data or Reports
P	Statement of Damage to Private Property
Q	Orders Appointing SIB
R	Diagrams (Fallout, Impact Area, etc.)
S	Photographs

Figure 8.3. AF Form 711J (Tabs for Part II of Formal Report)

USAF MISHAP REPORT INDEX TAB	
PART TWO -BOARD OR INVESTIGATOR ANALYSIS	
T	Investigation, Analysis, Findings and Recommendations
U	Statements and Testimony of Witnesses and Persons Involved
V	Statements of Persons Cited in Findings
W	Technical and Engineering Evaluations of Materiel
X	AF Form 711F - <i>Nuclear Accident/Incident Report</i>
Y	Life Sciences Narrative and Report
Z	SIB Proceedings

Figure 8.4. Example Timeline for Planning of SIB Activities.



Shaded Area – Information Gathering;
▼ – Rough Draft
◇ - Ready for Review
◆ - Review complete, ready for copying

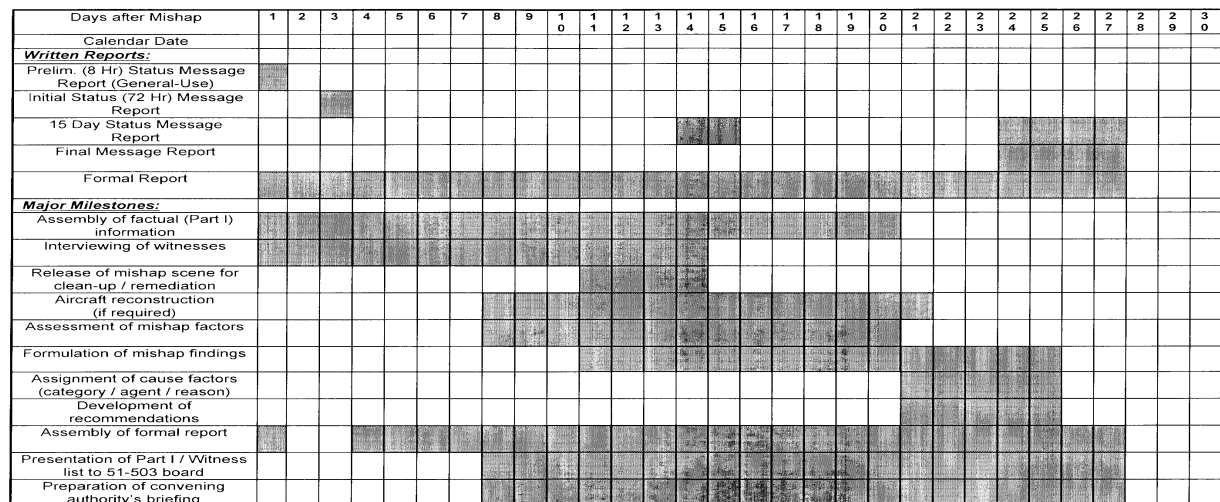


Figure 8.5. Report Cover Format (Sample).

**USAF
CLASS A FLIGHT MISHAP
[MDS]**

CREST(S)

PICTURE

[MISHAP DESCRIPTION]

S/N ##-####

DD MMM YY

**[INVOLVED WING]
[INVOLVED SQUADRON]
[LOCATION]**

COPY # of ##

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**THIS CONTAINS PRIVILEGED SAFETY INFORMATION. UNAUTHORIZED USE OR DISCLOSURE CAN
SUBJECT YOU TO CRIMINAL PROSECUTION, TERMINATION OF EMPLOYMENT, CIVIL LIABILITY, OR
OTHER ADVERSE ACTIONS. SEE AFI 91-204, CHAPTER 2, FOR RESTRICTIONS. DESTROY IN
ACCORDANCE WITH AFMAN 37-139 WHEN NO LONGER NEEDED FOR MISHAP PREVENTION
PURPOSES.**

**COPYING OR RELEASING ANY PORTION OF THIS REPORT IS PROHIBITED WITHOUT THE EXPRESS
WRITTEN PERMISSION OF THE AIR FORCE CHIEF OF SAFETY.**

Figure 8.6. Report Cover Spine Format (Sample).

**USAF
FLIGHT
MISHAP**

DD MMM YY

*CREST(S)/
PICTURE*

MDS/Tail Number

**Wing
Squadron
Location**

Copy # of ##

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INFORMATION. UNAUTHORIZED USE OR
DISCLOSURE CAN SUBJECT YOU TO CRIMINAL
PROSECUTION, TERMINATION OF
EMPLOYMENT, CIVIL LIABILITY, OR OTHER
ADVERSE ACTIONS. SEE AFI 91-204, CHAPTER
2, FOR RESTRICTIONS. DESTROY IN
ACCORDANCE WITH AFMAN 37-139 WHEN NO
LONGER NEEDED FOR MISHAP PREVENTION
PURPOSES.

COPYING OR RELEASING ANY PORTION OF
THIS REPORT IS PROHIBITED WITHOUT THE
EXPRESS WRITTEN PERMISSION OF THE AIR
FORCE CHIEF OF SAFETY

USAF MISHAP REPORT							
(Fill in all spaces applicable. If additional space is needed, use additional sheet(s).)							
1. DATE OF OCCURRENCE (Day, Month and Year)		2. VEHICLES (S) OR MATERIEL INVOLVED (Model designation and serial no. if applicable)			3. FOR GROUND ACCIDENTS ONLY (Base Code and Report Serial No.)		
4. PLACE OF OCCURRENCE				5. HOUR AND TIME ZONE (LOCAL)		6. <input type="checkbox"/> DAY <input type="checkbox"/> NIGHT <input type="checkbox"/> DAWN <input type="checkbox"/> DUSK	
7. ORGANIZATION POSSESSING OR OWNING VEHICLE OR MATERIEL AT TIME OF MISHAP							
MAJOR COMMAND	SUBCOMMAND OR AF	AIR DIVISION	WING	GROUP	SQUADRON OR UNIT	NAME AND BASE CODE	
8. (List of organizations of second vehicle, if they differ from item " above)							
9. ORGANIZATION AND BASE SUBMITTING REPORT (Do not abbreviate)							
10. LIST OF PERSONNEL DIRECTLY INVOLVED							
(See AFI 91-204 for specific instructions)							
LAST NAME, FIRST NAME, MIDDLE INITIAL	GRADE	SSAN	ASSIGNED DUTY	AERO RATING	DEGREE INJURY*	DAYS LOST ON TT ONLY	
*(Enter applicable letter(s) in DEGREE INJURY column. None-N; Temporary Total-TT; Permanent Partial-PP; Permanent Total-PT; Fatal-F; Missing-M)							
11. FACTUAL SUMMARY OF CIRCUMSTANCES. GIVE A DETAILED HISTORY OF FLIGHT OR CHRONOLOGICAL ORDER OF FACTS AND CIRCUMSTANCES LEADING TO THE MISHAP. THE RESULTS OF INVESTIGATION WILL BE CONTAINED IN THE "ANALYSIS PART" OF THE REPORT. ANALYSIS OF AND CONCLUSION DRAWN FROM ORAL OR WRITTEN STATEMENTS OBTAINED ONLY IN THE INTEREST OF MISHAP PREVENTION WILL NOT BE INCLUDED IN THIS SUMMARY.							
12. AUTHENTICATION							
CERTIFICATION BY (Title) Board President	TYPED NAME AND GRADE			SIGNATURE		DATE	

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Figure 8.8. AF Form 711B, Aircraft Flight Mishap Report.

AIRCRAFT FLIGHT MISHAP REPORT										
<i>(To be filled out for principal aircraft involved. Appropriate items should be filled out on secondary aircraft)</i>										
1. MISHAP CLASS		2. ACFT MDS AND SERIAL NUMBER		3. DATE		4. UNIT CONTROL NUMBER		5. ACFT ASSIGNMENT/ STATUS CODE		
PILOT (S) INVOLVED (FLIGHT CREW) ¹										
6. OPERATOR AT CONTROLS										
A. LAST NAME, INITIALS					B. COMPONENT					
POSITION IN AIRCRAFT AT TIME OF MISHAP										
FRONT SEAT		LEFT SEAT		REAR SEAT		RIGHT SEAT		JUMP SEAT		
F. MAJCOM, NAF, DIV, WG, SQ ASSIGNED					G. MAJCOM, NAF, DIV, WG, SQ ATTACHED FOR FLYING					
7. OTHER PILOT										
A. LAST NAME, INITIALS					B. COMPONENT					
POSITION IN AIRCRAFT AT TIME OF MISHAP										
FRONT SEAT		LEFT SEAT		REAR SEAT		RIGHT SEAT		JUMP SEAT		
F. MAJCOM, NAF, DIV, WG, SQ ASSIGNED					G. MAJCOM, NAF, DIV, WG, SQ ATTACHED FOR FLYING					
8. OTHER PILOT										
A. LAST NAME, INITIALS					B. COMPONENT					
POSITION IN AIRCRAFT AT TIME OF MISHAP										
FRONT SEAT		LEFT SEAT		REAR SEAT		RIGHT SEAT		JUMP SEAT		
F. MAJCOM, NAF, DIV, WG, SQ ASSIGNED					G. MAJCOM, NAF, DIV, WG, SQ ATTACHED FOR FLYING					
9. OTHER PILOT										
A. LAST NAME, INITIALS					B. COMPONENT					
POSITION IN AIRCRAFT AT TIME OF MISHAP										
FRONT SEAT		LEFT SEAT		REAR SEAT		RIGHT SEAT		JUMP SEAT		
F. MAJCOM, NAF, DIV, WG, SQ ASSIGNED					G. MAJCOM, NAF, DIV, WG, SQ ATTACHED FOR FLYING					
10. CLEARANCE										
FROM					TO					
VFR		IFR		LOCAL		PT TO PT		DIRECT		
11. DURATION OF FLIGHT		TENTHS		12. TYPE OF MISSION				13. ALTITUDE/ELEVATION		
14. PHASE OF OPERATION					15. TYPE OF MISHAP					
16. METEOROLOGICAL CONDITIONS										
17. AIRFIELD DATA APPLICABLE TO TAKEOFF AND LANDING MISHAPS OCCURRING WITHIN 2 MILES OF AIRFIELD										
A. FIELD ELEVATION (feet)					B. COMPOSITION OF RUNWAY					
C. LENGTH OF RUNWAY (feet)			D. RUNWAY HEADING			E. DISTANCE OF TOUCHDOWN FROM RUNWAY (feet)			F. SURFACE CONDITION	
G. LENGTH OF OVERRUN		H. COMPOSITION OF OVERRUN (Specify)		I. BARRIER TYPE		USED		LOCATION		
						YES NO				
J. CONDITIONS AFFECTING OCCURRENCE (For example, type of instrument or lighting approach used, obstructions, barrier, airspeed, gross weight, forced landing)										

¹If more than four pilots are involved (Flight Crew) report same information required on additional sheet for each.

AF Form 711B

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Chapter 9

OTHER INVESTIGATIONS ASSOCIATED WITH MAJOR MISHAPS

9.1. Introduction. Depending on the circumstances, more than one agency may investigate a mishap, or it may be necessary for Air Force safety investigators to work under other than typical directives and restrictions. While safety investigators are naturally most concerned with the AFI 91-204 investigation and reporting, it is equally important to be aware of the various other possible investigations and how the safety investigation process may have to interact with them.

9.2. Accident (AFI 51-503) Investigation Criteria.

9.2.1. Investigations under AFI 51-503, *Aerospace Accident Investigations*, are convened for any accident involving one or more of the following:

9.2.1.1. All Class A accidents, as defined by AFI 91-204

9.2.1.2. There is probable high public interest

9.2.1.3. All suspected cases of friendly fire

9.2.2. In addition, a convening authority should consider convening an accident board when:

9.2.2.1. There is anticipated litigation for or against the Government or a Government contractor.

9.2.2.2. There is anticipated disciplinary action under the UCMJ or adverse administrative action against any individual.

9.2.2.3. There are damages to third parties that likely will exceed \$250K.

9.2.3. The convening authority also has the discretionary authority to convene an accident board in any other space, missile, nuclear, or aircraft accident.

9.3. Accident Investigation Purpose and Related Policies. The purpose of an accident investigation under AFI 51-503 is to provide a publicly releasable report of the facts and circumstances surrounding the accident, to include a statement of opinion on the cause of the accident; to gather and preserve evidence for claims, litigation, disciplinary, and adverse administrative actions; and for all other purposes. Because of the difference in uses of SIB and AIB reports, convening authorities, board members, and witnesses who testify or submit statements to these boards must clearly understand the following points.

9.3.1. Testimony or statements a witness (including personnel involved in a mishap) gives to the SIB, when a promise of confidentiality is extended, may not be used by nor shown to the AIB either in whole or in part. Witnesses are usually given promises of confidentiality in conjunction with their testimony.

9.3.2. Commanders at all echelons have access to both safety and accident investigation reports, since they are responsible for both the safety of the resources entrusted to them and the preservation of good order and discipline. However, it is impermissible for them to take action against an individual based on the findings, causes, and recommendations of a SIB. Some safety-based actions (administrative grounding, downgrading, etc.) taken in response to a safety report's conclusions, while perceived as having adverse career implications on an individual, do not meet the legal definition of "adverse action."

9.3.3. Members of an SIB may not be appointed to the AIB investigating the same mishap. (SIB members include primary and non-primary members and technical advisors, both civilian and military.) Full time safety personnel may not be on an AIB.

9.3.4. Witnesses may not appear before an AIB until the SIB releases them. These witnesses may not identify what they told the SIB.

9.3.5. No member of the AIB may be a part of any SIB deliberations, nor may they participate in any SIB witness interviews.

9.3.6. No one with access to SIB findings or recommendations may divulge them to anyone associated with the AIB, or anyone outside of safety. These restrictions include any person who may have knowledge of the substance of an SIB report and may subsequently be called as a witness before an AIB investigating the same mishap.

9.4. Precedence of the Safety Investigation Over the Accident Investigation:

9.4.1. If an AFI 51-503 investigation is in progress at the same time as the AFI 91-204 investigation, the SIB must conduct its investigation independent of the AIB investigation. Because of the possible safety implications to other aircraft, the activities of the SIB take priority over those of the AIB, and the SIB has "exclusive first rights" to witnesses and all physical evidence. However, the SIB president is also required to ensure the AIB has equal access to the evidence.

9.4.2. Factual documentary evidence incorporated in Part I of the SIB formal report (flight plans, manifests, flight records, etc.) as well as toxicology and autopsy reports are provided to the AIB, and may be provided prior to the completion of the full report to facilitate the AIB investigation. Otherwise, the AIB obtains its evidence from the same sources that provided it to the SIB.

9.4.3. The SIB is required to provide the AIB a list of all witnesses contacted in the course of their investigation. They should do so as soon as they are finished with the witnesses, but must do so not later than upon completion of the formal report.

9.4.4. The SIB must allow the AIB a reasonable amount of time to perform a crash scene investigation before disturbing the evidence by movement, disassembly, etc. If the urgency of the situation precludes this (due to environmental damage, urgent and compelling military necessity, the need to clear a public right-of-way, etc.), then the SIB documents the scene with photographs and a wreckage-distribution diagram that is provided to the AIB by the activities providing the service.

9.4.5. If the SIB removes components for teardown analysis, they must advise the AIB of having done so. The original copies of AFTO records associated with components designated for teardown must not be shipped, but are retained for the AIB.

9.4.6. Air Force safety and accident investigations and their associated instructions are based on a presumption that an investigation under AFI 91-204 will generally be conducted first, followed by an AFI 51-503 investigation. AFI 51-503 is specifically structured such that "any Class A mishap" (a "safety" term and determination) automatically triggers the need for a subsequent accident investigation. However, in rare cases, it is in the interest of the United States Air Force to either precede or completely supplant a safety investigation with one conducted purely in accordance with AFI 51-503 (an "accident-only" investigation).

9.5. Air Force Participation in National Transportation Safety Board (NTSB) Investigations.

9.5.1. A mishap involving both military and civilian aircraft requires investigation by the NTSB as the primary investigative agency. It probably also requires a simultaneous investigation by the military service involved. The NTSB's investigation takes precedence over all other investigations. This means that the designated NTSB Investigator-In-Charge (IIC):

9.5.1.1. Controls access to the scene (unless the Air Force has established a National Defense Area).

9.5.1.2. Controls the disposition of physical evidence (except classified equipment).

9.5.2. Consult AFJI 91-206, *Participation in a Military or Civil Aircraft Accident Safety Investigation* for details, and call the AFSC/JA if you have any further questions.

9.6. Investigation of Mishaps Involving Air Force Aircraft Classified as "Public Use" Aircraft. A 1995 change to the NTSB's enabling legislation creates the possibility that certain Air Force mishaps without civil aviation involvement could fall under the jurisdiction of the NTSB. Air Force aircraft occasionally perform higher-headquarters directed missions at the request of civil agencies, such as the Department of State, the Department of Justice, or the Department of the Interior, which constitute "public use" applications under the new law. The Air Force has objected to this interpretation, which has not been tested in an actual mishap since the law went into effect. Our position is that military members, operating military aircraft in accordance with approved military procedures are exempt from outside investigation. However, if the NTSB elects to exercise authority under the present language, board presidents are to provisionally defer to the IIC's authority and contact HQ AFSC immediately. Examples of affected missions may include:

9.6.1. Fire-fighting.

9.6.2. Aerial spraying.

9.6.3. Humanitarian airlift.

9.7. NTSB/FAA Participation in Air Force Safety Investigations. Either the NTSB or the FAA may ask to participate as observers in Air Force safety investigations. This may be due to a special interest in the airframe involved, concern for common procedures or facilities such as air traffic control or weather forecasting, or for other reasons. AFJI 91-206 discusses conditions of FAA and NTSB participation. Neither organization participates in the determination of causal factors, nor may they participate in developing SIB findings or recommendations.

9.8. Safety Investigations Involving Members or Resources of Both the Air Force and Other Services. If a mishap involves aircraft, materiel, facilities, or personnel from the USAF and another Service or the Coast Guard, the investigation will be convened under a single Service's procedures but conducted jointly and with joint membership in accordance with the current Inter-Service Memorandum of Understanding. Each Service reserves the right to conduct independent, concurrent safety investigations, but the joint investigation takes precedence in access to evidence and witnesses. Generally, the Service experiencing the greatest loss will convene the investigation. "Greatest loss" is assessed in the following order:

9.8.1. Loss of life/permanent total disability.

9.8.2. Destruction of an aircraft.

9.8.3. Dollar loss.

9.9. Investigations in Foreign Countries. Special considerations or circumstances may apply to safety investigations outside of US territories. In each case, boards should consult their convening authority to determine unique area requirements.

9.9.1. In addition to AFI 91-204, NATO STANAG 3531 applies to mishaps involving NATO aircraft, missiles, or personnel.

9.9.2. One or more observers from the host nation's military or other government agency will likely be assigned to the SIB, but will not be allowed access to privileged information or participate in board deliberations.

9.9.3. USAF mishaps in other countries, such as Korea and Iceland, may be subject to separate, bilateral Status of Forces Agreements (SOFA).

9.9.4. USAF mishaps in countries that are not members of major treaty organizations may fall under the purview of the International Civil Aviation Organization (ICAO), depending upon the requirements of the country involved. For investigations conducted under ICAO rules, the NTSB is the authorized US representative to the investigation, and the Air Force may seek access through their sponsorship.

9.9.5. USAF mishaps involving the possibility of involvement by a foreign national (air traffic controller, marshaller, etc.) must be handled on a case-by-case basis to avoid diplomatic, legal, or labor union complications.

9.10. Chief of Staff/Chief of Safety-Directed Investigations. The Air Force Chief of Staff or Chief of Safety may assume convening authority for any mishap. In this case, the board president may be selected from among the HQ AFSC staff, and other primary members for the board may be selected from any command in the Air Force. The convening authority is entitled to have a primary member on an Air Force Safety Center-led SIB.

9.11. Attempts to Gain Access to USAF Safety Investigation Witness Testimony for Other Than Safety Investigations. It is essential that all USAF personnel associated with a mishap, both investigators and witnesses, understand and appreciate the significant differences between Air Force safety investigations and other investigations. If they do not, the protections accorded safety testimony may be placed in jeopardy.

9.11.1. AFI 91-204 stipulates that the USAF may not use, extract, nor quote SIB witness testimony for any purpose other than mishap prevention. Consistent assertion of the privileged nature of safety testimony is mandatory to demonstrate our ongoing intent to protect its privileged status.

9.11.2. Our intent is for witnesses to be able to give testimony in a safety investigation freely, either orally or in writing, without fear of disciplinary action, civil action, or other penalty. The Air Force offers this protection to ensure witnesses provide the SIB with complete and truthful information regarding the circumstances surrounding the mishaps.

9.11.3. **Figure 9.1.** compares the different ways safety, accident, and NTSB investigations treat witness testimony.

9.12. Requests or Subpoenas for Witnesses and Information. Immediately notify the HQ AFSC/JA, or AFLSA/JACT, if you or anyone associated with your investigation receives a subpoena or request to

produce information, documents, testimony, or personal identifying information of witnesses for any purpose.

Figure 9.1. Investigation Differences in Witness Testimony.

	AFI 91-204	AFI 51-503	49 CFR 831
	[Safety]	[Accident]	[NTSB]
Witness sworn?	No	Yes	Maybe (5)
Accompanied by lawyer?	No (1)	Yes, if suspect	Yes, if suspect
Statement released?	Maybe (9)	Yes	Yes
Analysis released?	No	Yes	Yes (6)
Findings released?	No	Yes	Yes
Military/DoD Civilians compelled to appear?	Yes	Yes	Yes (7)
Military/DoD Civilians compelled to testify?	Yes (10)	Yes (4)	Yes (4)
Non-DoD Civilian compelled to appear?	No	No	Yes (7)
Non-DoD Civilian compelled to testify?	No	No	Yes (4)
Contractor compelled to appear?	No	No	Yes (7)
Contractor participates?	Yes (2)	Maybe	Yes (2)
Contractor's input released?	Maybe (9)	Yes	Yes (8)
Report admissible in court?	No (3)	Yes	No (8)

NOTES:

- (1) Non-USAF witnesses cannot be compelled to testify. They could insist on representation as a condition of appearance.
- (2) With approval of board president or senior investigator.
- (3) The USAF asserts a claim of executive privilege to prevent release or entry as evidence of privileged portions of safety reports. Only nonprivileged portions (Part I) are admissible, normally as part of the AFI 51-503 report.
- (4) Entitled to legal counsel. Not required to answer incriminating questions.
- (5) Witnesses at NTSB public hearings are always sworn. During safety investigations, they are usually not sworn.
- (6) Analysis of individual NTSB investigators is withheld under exemption 5, FOIA.
- (7) NTSB has subpoena authority.
- (8) By law, no one may introduce any part of an NTSB report as evidence in a court of law.
- (9) Part I of Safety Investigation is releasable. All non-privileged information is contained in Part I, which may include lab and/or contractor reports and some witness interviews. Contractor reports, or portions thereof, can be privileged and included in Part 2., see AFI 91-204, para 2.1.2.2.2.
- (10) See AFI 91-204, para. 4.5.5.2.

TIMOTHY A. PEPPE, Major General, USAF
Chief of Safety

Attachment 1**GLOSSARY OF REFERENCES AND SUPPORTING INFORMATION*****References***

5 U.S.C. 552, *Freedom of Information Act*

10 U.S.C. 2254, *Use of Aircraft Accident Reports*

18 U.S.C. 793

18 U.S.C. 795

18 U.S.C. 797

AFPD 35-1, *Public Affairs Management*

AFPD 36-27, *Social Actions*

AFPD 91-2, *Safety Programs*

AFI 10-601, *Mission Needs and Operational Requirements Guidance and Procedures*

AFI 11-202, *Volume 3 General Flight Rules*

AFI 11-215, *Flight Manuals Program*

AFI 11-401, *Flight Management*

AFI 13-202, *Overdue Aircraft*

AFI 16-402, *Aerospace Vehicle Programming, Assignment, Distribution, Accounting, and Termination*

AFI 21-103, *Equipment Inventory, Status and Utilization Reporting*

AFI 23-101, *Centrally Managed Equipment*

AFI 31-401, *Information Security Program Management*

AFI 32-2001, *The Fire Protection Operations and Fire Prevention Program*

AFI 32-4001, *Disaster Preparedness Planning and Operations*

AFI 33-212, *Reporting COMSEC Incidents*

AFI 34-217, *Air Force Aero Club Program*

AFI 34-242, *Mortuary Affairs Program*

AFI 34-501, *Mortuary Affairs Program*

AFI 34-1101, *Assistance to Families of Persons Involved in Air Force Aviation Mishaps*

AFI 35-101, *Public Affairs Policies and Procedures*

AFI 36-3002, *Casualty Services*

AFI 36-3206, *Administrative Discharge Procedures for Commissioned Officers*

AFI 36-3207, *Separating Commissioned Officers*

AFI 36-3209, *Separation Procedures for Air National Guard and Air Force Reserve Members*

AFI 37-131, *Air Force Freedom of Information Act Program*

AFI 37-138, *Records Disposition-Procedures and Responsibilities*

AFI 44-120, *Drug Abuse Testing Program*

AFI 44-153, *Critical Incident Stress Management*

AFI 51-502, *Personnel Claims*

AFI 51-503, *Aerospace Accident Investigations*

AFI 65-503, *US Air Force Cost and Planning Factors*

AFI 65-601, Volume 1 *Budget Guidance and Procedures*

AFI 65-601, Volume 2 *Budget Management for Operations*

AFI 91-202, *The Air Force Mishap Prevention Program*

AFI 91-204, *Safety Investigations and Reports*

AFI 91-301, *The Air Force Occupational and Environmental Safety, Fire Protection, and Health (AFOOT) Program*

AFJI 91-206, *Participation in a Military or Civil Aircraft Accident Safety Investigation*

AFMAN 10-206, *Operational Reporting*

AFMAN 32-4004, *Emergency Response Operations*

AFMAN 34-232, *Air Force Aero Club Operations*

AFMAN 36-503, *Skill Coding*

AFMAN 37-139, *Records Disposition-Schedule*

AFPAM 91-212, *Bird Aircraft Strike Hazard (BASH) Management Techniques*

AFDIR 37-135, *Air Force Address Directory*

DoDI 6055.7, *Accident Investigating, Reporting, and Record keeping*

DoDD 5400.7, *DoD Freedom of Information Act Program*

JCS Publication 1-03.6, *Joint Reporting Structure, Event/Incidents Report, November 1980*

JCS Publication 6-04.22, *USMTF Message Preparation Instructions, October 1992*

NATO Air Standard 85/2A, *Investigation of Aircraft/Missile Accidents/Incidents*

NATO STANAG 3101, *North Atlantic Treaty Organization Exchange of Accident/Incident Information Concerning Aircraft and Missiles, 22 September 1989*

NATO STANAG 3102, *Flight Safety Cooperation, 5 June 1990*

NATO STANAG 3531, *Safety Investigation and Reporting of Accident/Incidents Involving Military Aircraft and/or Missiles, 4 October 1991*

Abbreviations and Acronyms

AF—Air Force
AF/SE—Air Force Chief of Safety
AFI—Air Force Instruction
AFIP—Armed Forces Institute of Pathology
AFJI—Air Force Joint Instruction
AFMAN—Air Force Manual
AFMC—Air Force Materiel Command
AFPAM—Air Force Pamphlet
AFPD—Air Force Policy Directive
AFRC—Air Force Reserve Command
AFSC—Air Force Safety Center
AFSC/JA—Safety Office of the Staff Judge Advocate
AFSC/SEF—Aircraft Safety
AFSC/SEG—Ground Safety
AFSC/SEP—Safety Policy, Plans and Programs
AFTO—Air Force Technical Order
AGE—Aerospace Ground Equipment
AGL—Above Ground Level
AIB—Accident Investigation Board
AIG—Address Indicating Group
ALC—Air Logistics Center
AMIC—Aircraft Mishap Investigation Course
ANG—Air National Guard
ARTCC—Air Route Traffic Control Center
ATC—Air Traffic Control
BASH—Bird/Wildlife Aircraft Strike Hazard
BPC—Board Presidents Course
C—Degrees Celsius
CAR—Category-Agent-Reason Methodology
CAT—Crisis Action Team
CE—Civil Engineering

CG—Center of Gravity
CINC—Commander In Chief
CISM—Critical Incident Stress Management
CMR—Consolidated Mishap Report
CONU—Continental United States
COS—Chief of Safety
CRM—Crew/Cockpit Resource Management
CSFDR—Crash Survivable Flight Data Recorder
CVR—Cockpit Voice Recorder
DCG—Disaster Control Group
DoD—Department of Defense
DMS—Defense Messaging System
DRF—Disaster Response Force
DSN—Defense Switched Network
EOD—Explosive Ordnance Disposal
F—Degrees Fahrenheit
FAA—Federal Aviation Administration
FAX—Facsimile Machine
FCB—Flight Crew Bulletin
FCIF—Flight Crew Information File
FDR—Flight Data Recorders
FEB—Flying Evaluation Board
FEF—Flight Evaluation Folder
FLIP—Flight Information Publication
FOD—Foreign Object Damage
FOIA—Freedom of Information Act
FOUO—For Official Use Only
FSO—Flying Safety Officer
FTS—Federal Telecommunication System
G—Measurement of Force Equal to the Force of Gravity
HAP—High Accident Potential
HAZMAT—Hazardous Material

HF—Human Factors
HQ—Headquarters
HUD—Heads-up Display
ICAO—International Civil Aviation Organization
IDMT—Independent Duty Medical Technician
IIC—Investigator-In-Charge
IMC—Instrument Meteorological Conditions
IP—Instructor Pilot
ISB—Interim Safety Board
JA—Judge Advocate
JEMIC—Jet Engine Mishap Investigation Course
KIAS—Knots of Indicated Airspeed
LG/CC—Logistics Group Commander
LSM—Life Support Member
LSR—Life Sciences Report
MAAF—Mishap Analysis and Animation Facility
MAJCOM—Major Command
MARE—Major Accident Response Exercises
MDG/CC—Medical Group Commander
MDS—Mission Design Series
MOFE—Memorandum of Final Evaluation
MP—Mission Pilot
MRP—Mishap Response Plan
MSL—Mean Sea Level
NAF—Non-Appropriated Fund or Numbered Air Force
NCO—Non-Commissioned Officer
NOK—Next of Kin
NOTAM—Notice to Airmen
NTSB—National Transportation Safety Board
OFS—Other Findings of Significance
OG/CC—Operations Group Commander
OPR—Office of Primary Responsibility

OPREP—Operational Report
ORS—Other Recommendations of Significance
OSC—On Scene Commander
PA—Public Affairs
PAO—Public Affairs Officer
PME—Professional Military Education
PPE—Personal Protective Equipment
PQDR—Product Quality Deficiency Report
QA—Quality Assurance
RAPCON—Radar Approach Control
SAR—Search and Rescue
SE—Chief of Safety
SG—Surgeon General
SIB—Safety Investigation Board
SID—Standard Instrument Departure
SOFA—Status of Forces Agreement
SOP—Standard Operating Procedure
SPD—System Program Director
SPG/CC—Support Group Commander
SQ—Squadron
SSAN—Social Security Account Number
STANAG—Standardization Agreement
SUPT—Specialized Undergraduate Pilot Training
TCTO—Time Compliance Technical Order
TDY—Temporary Duty
TDR—Teardown Deficiency Report
T.O.—Technical Order
TOX—Toxicological
UCMJ—Uniform Code of Military Justice
USAF—United States Air Force
VMC—Visual Meteorological Conditions
VTR—Videotape Recording

WG/CC—Wing Commander

Terms

Addendum—Additional written comments made by the MAJCOM/CC and attached to the SIB's formal report or final mishap message.

Aero club aircraft—These are all aircraft assigned to the respective Aero Club. The Aero Club through, purchase, lease, or loan from the government may have acquired these aircraft. Aero Clubs are authorized excess DoD and GSA aircraft on a loan basis. **NOTE:** Air Force Aircraft on-loan to Aero Club are Aero Club aircraft and reported under the provisions of Chapter 14 not Chapter 7.

Air Force at large—This term is used in two separate cases in this document. For Category-Agent-Reason Methodology this includes exchange students, military members in a non-pay status while waiting for appellate review if they have no written or verbal orders to return to an Air Force installation, prior service personnel on leave before reporting to initial permanent duty assignment, personnel on terminal leave, etc. For Mishap reporting categorization it includes aircraft leased to manufacturers for demonstration purposes (code XY) if the lessee does not assume the risk of loss. It is also used for unified or joint command mishaps where the flying hours are not assigned to a specific major command.

Air Reserve Components (ARC)—All units, organizations, and members of the ANG and AFRC (10 U.S.C. 261) on active duty, on active duty for training, or in drill status, and ANG and AFRC technicians; include ANG and AFRC property and equipment. Military status starts upon beginning duty for military pay and ends when duty stops. (All references to Air Force military personnel and property also apply to ARC military personnel and property).

Aircraft mishap—An unplanned event or series of events involving an Air Force Aircraft that: a) results in damage to an Air Force Aircraft; and/or b) if a flight crewmember is onboard for any reason, results in damage to any property, and/or injury, illness or death. The term “onboard” includes all interior and exterior aircraft surfaces. See AFI 91-204 for non-reportable mishaps and for mishap classifications, which determine reporting requirements. There are three types of Aircraft Mishaps. Aircraft Flight, Aircraft Flight-Related, and Aircraft Ground Operations.

Aircraft flight mishap—An aircraft mishap in which there is Intent for Flight and there is reportable damage to an aircraft. Explosives, Chemical Agent, or Missile events, which cause damage to an aircraft with Intent for Flight, are categorized as Aircraft Flight mishaps to avoid dual reporting.

Aircraft flight related mishap—An aircraft mishap in which there is Intent for Flight and no reportable damage to the aircraft itself; but the mishap involves a reportable injury, fatality, or reportable property damage. These mishaps may involve non-aircrew fatality, injury, or collateral damage

Aircraft ground operations mishap—An Aircraft mishap in which there is not Intent for Flight. This sub-category does not include mishaps in which: damage occurs to an unattended parked aircraft; damage is caused by weather, natural phenomena (such as an earthquake), or a building fire; or damage occurs to an aircraft while it is being handled as cargo.

Causal finding—Causal findings are those which, singly or in combination with other causal findings, logically result in damage or injury. They are identified with the word “cause” at the start of the text of the finding, and must contain category-agent-reason information.

Cause—A cause is a deficiency the correction, elimination, or avoidance of would likely have prevented

or mitigated the mishap damage and/or injuries.

Collateral damage—Damage or injury caused by a mishap other than the damage, destruction, or injury to the mishap equipment or personnel.

Combat training mishap—Mishaps resulting from peacetime combat simulated exercises, obstacle/confidence course injuries, installation exercises, and IG exercises that test combat capability. Also includes vehicle, equipment, or other property damage that occur during combat training.

Competent medical authority—Allopathic (MD), osteopathic (DO), and chiropractic practitioners, as well as podiatrists, optometrists, dentists, and clinical psychologists. The term competent medical authority includes these medical practitioners only to the extent of their operations within the scope of their practice as defined by state law and subject to regulation by the Secretary of Labor. Competent medical authority also includes nurse practitioners and physician assistants under supervision of licensed medical practitioners.

Convening authority—The individual who has the authority to order a mishap investigation with a single investigator or board.

Critical profile—A mission profile exceeding system limitations based on system specifications or other program documentation.

Department of Defense aircraft (Air Force aircraft)—All manned weight-carrying devices supported in flight by buoyancy or dynamic action and are owned or leased by the DoD Components (including Reserve forces and National Guard). Includes aircraft that are operated and exclusively controlled or directed by a DoD Component. Includes aircraft furnished by the Government or on bailment to a non-DoD organization for modification, maintenance, repair, test, contract training, or experimental project for a DoD Component, when the Government has assumed ground and flight risk. Includes aircraft under test by a DoD Component. (This includes aircraft furnished by a contractor or another Government Agency when operated by a DoD aircrew in official status and a DD Form 250, "Material Inspection and Receiving Report," has been executed to certify that the Department of Defense has accepted the aircraft.). Excludes aircraft leased, on bailment, or loaned to contractors, commercial airlines, other Government Agencies, or foreign governments, when the lessee has assumed risk of loss. Excludes civil aircraft owned by civil operators and accomplishing contract air missions for the DoD Components. Excludes factory-new production aircraft until successful completion of the post-production acceptance flight. Excludes flying club aircraft or privately owned aircraft on DoD installations.

Department of Defense civilian personnel—DoD Civil Service employees (including Reserve Component military reserve technicians and Reserve technicians, unless in a military duty status); non-appropriated fund employees (excluding military personnel working part-time to avoid dual reporting); Corps of Engineers Civil Works employees; Youth or Student Assistance Program employees; foreign nationals employed by the DoD Components; and Army-Air Force Exchange Service employees.

Department of Defense military personnel—All U.S. military personnel on active duty under the provisions of 10 U.S.C. (reference (h)); Reserve Component personnel, National Guard personnel under the provisions of 32 U.S.C. (reference (i)); Service Academy cadets; Reserve Officer Training Corps cadets when engaged in directed training activities; foreign national military personnel assigned to the DoD Components.

Department of the Air Force (DAF) civilian personnel—Includes Senior Executive Service (SES), general schedule (GS) and wage grade (WG) employees, including ANG and AFRC technicians, unless

in military duty status. Includes non-appropriated fund (NAF) employees who are not military personnel working part time. Includes Youth Opportunity Program and Student Assistance Program employees. Includes foreign-national civilians employed by Air Force in direct or indirect-hire status. Foreign-national, direct-hire employees are the same as DAF civilian employees. Foreign-national, indirect-hire employees are the same as DAF civilian employees only when the Air Force has supervisory or work performance control. This includes Air Force responsibility for any compensation claims arising from employment injury.

Department of the Air Force military personnel—These are Air Force personnel on active duty with the Air Force or ANG and AFRC personnel on military duty status. Includes Air Force Academy cadets and Reserve Officer Training Corps (ROTC) cadets engaged in directed training activities. Includes members of other US military services serving on extended active duty with the Air Force or foreign-national military personnel assigned to the Air Force.

Ejection attempt—Completion of the action by the aircrew to initiate the ejection system, regardless of the outcome. For single motion systems, this only requires pulling the handle. For dual motion systems, both raising the sidearm and squeezing the trigger must be accomplished.

Ejection episode—A sequence of events beginning with the ejection attempt (or inadvertent initiation) and ending after landing. This normally consists of three parts (ejection, descent, and landing). However, ground impact or mechanical malfunction may arrest it at any stage.

Ejection system—A mechanical device designed to forcefully separate the crew from the aircraft and return them to the earth's surface. Examples are an ejection seat, an extraction system, or a crew module.

Factor—. Any unusual, out-of-the-ordinary, or deficient action or condition discovered in the course of a mishap investigation, which in the investigator's opinion contributed to the eventual outcome. Factors may include both "causes" (see above) and non-causal actions and conditions. Examples of non-causal conditions that could be considered factors:

Investigators discover unit leadership has failed to correct breaches of flight discipline by unit personnel other than the mishap pilot, leading the pilot to attempt an unauthorized maneuver. ("Unit supervision was a factor in the mishap.")

Investigators conclude deteriorating weather conditions resulted in a rushed, inadequate preflight, and the mishap flight engineer failed to ensure an engine cowling was properly secured. ("Weather was a factor in the mishap.")

Investigators determine that a loud party interrupted mishap crewmembers' sleep several times during the night, and that their subsequent poor performance could be at least partially attributable to fatigue. ("Inadequate billeting and crew rest were factors in the mishap.")

Fatal injury—Injuries resulting in death, either in the mishap or at any later time, to include within 30 days subsequent to the medical discharge, retirement, or separation from the service, due to complications arising from mishap injuries.

Findings—Findings are the conclusions of the SIB or investigator. They are single statements, in chronological order, of each significant event or condition sustaining the sequence leading to the mishap.

Fire mishap—An accident with reportable damage to real property or equipment or reportable injury to DoD personnel resulting from fire, but does not involve a MDS weapon system or explosives. This accident category also includes non-DoD personnel when DoD property or equipment fires caused the

injury.

FOD mishaps—Reportable mishaps confined to turbine engine damage as a result of external foreign objects.

Friendly fire—A circumstance in which members of a U.S. or friendly military force are mistakenly or accidentally killed or injured in action by U.S. or friendly forces actively engaged with an enemy or who are directing fire at a hostile force or what is thought to be a hostile force.

High accident potential (HAP) events—Significant aircraft, missile, space, explosives, miscellaneous air operations, or ground occurrences with a high potential for causing injury, occupational illness, or damage if they recur. These events do not have reportable mishap costs. If the event meets reportable mishap criteria, do not designate it as a HAP. Do not use the HAP designation with any class of mishap.

Inadvertent ejection—Inadvertent initiation (mechanical or human) of the ejection system during flight by any stimulus except impact forces or thermal cook off. This includes initiation by windblast forces, but excludes impact with trees, ground, or water.

In-flight shutdown (IFSD)—Any engine shutdown in-flight, either due to an engine malfunction or by the aircrew following flight manual procedures.

Non-recoverable in-flight shutdown—Any engine shutdown in-flight, either due to an engine malfunction or by the aircrew following flight manual procedures whereby: The engine is unable to restart, or further investigation determines that a restart attempt would not have been successful, or further investigation determines that continued operation would have caused the engine to fail, or the aircraft cannot maintain level flight at a safe altitude as determined by the situation.

Injury—Traumatic bodily harm, comprising such conditions as fractures, lacerations, sprains, strains, dislocations, concussions, and compressions, which results from an unplanned event. Classify single exposure incidents occurring in the work place or within a single duty shift as injuries when they involve foreign objects in the eye, such as a piece of metal, chemical burns to the eye or skin, such as those caused by splashed material at a wash rack, or loss of consciousness. Report an injury if it results in a fatality, regardless of the length of time between injury and death, a lost workday case, or a non fatal case without lost workdays.

Intent for flight—Intent for Flight is considered to exist when aircraft brakes are released (if set) and/or when takeoff power is applied for commencing an authorized flight. Intent for flight continues until a fixed wing aircraft safely taxis clear of the runway. Application of takeoff power begins at the first movement of the throttle towards takeoff power. Clear of the runway means the entire aircraft is physically off the active runway. Intent for flight continues until a rotary wing aircraft has alighted and the aircraft weight is supported by the landing gear. Hover taxi is considered flight.

Licensed launch—Any commercial launch that is not indemnified by the government and has been issued a license by the Department of Transportation.

MAJCOM Commander—The term “MAJCOM commander” as used in this instruction includes field operating agency (FOA) and direct reporting unit (DRU) commanders, system program directors (SPD) or equivalent, Air Force Program Executive Officers (AFPEO), etc. In addition, this term includes the air component commander of unified commands during contingency operations.

Miscellaneous air operations mishaps—A mishap resulting in a fatality or injury to Air Force personnel where intent for flight exists but not involving a DoD aircraft.

Mishap—An unplanned event, or series of events, that results in damage to DoD property; occupational illness to DoD military or civilian personnel; injury to DoD military personnel on-or off-duty; injury to on-duty civilian personnel; damage to public and private property or injury and illness to non-DoD personnel caused by DoD operations. Also includes degradation of nuclear or radiological safety.

Mishap costs—These are the total costs of damage, injury and illness from Air Force mishaps. Use total mishap cost to classify non-nuclear mishaps. For mishap classes and criteria and determining mishap costs see AFI 91-204.

Non-DAF civilian personnel—Persons employed by host-nation agencies, and doing work such as public works or general engineering on Air Force installations, are not Air Force employees. Their employer is the host-nation agency paying them, supervising them, and handling employee benefits. Indirect-hire employees are not the same persons as DAF civilian employees when a host government has supervisory control. This includes the host government's responsibility for insurance, compensation costs, and the like.

Off-duty—DoD personnel are off-duty when they are not on-duty.

Off-duty military mishap—A DoD mishap that results in a fatality or lost time case to off-duty DoD military personnel whether or not on a DoD installation, excluding Private Motor Vehicle (PMV) mishaps.

On-duty—DoD personnel are on-duty when physically present at any location where they are to perform their officially assigned work. Officially assigned work includes organization-sponsored events where an employee is required to attend, regardless of location. (This includes those activities incident to normal work activities that occur on DoD installations, such as lunch, coffee, or rest breaks, and all activities aboard military vessels). DoD personnel are on-duty when being transported by DoD or commercial conveyance to perform officially assigned work. (This includes travel in private motor vehicles (PMV) or commercial conveyances while performing official duty, but not routine travel to and from work). DoD personnel are on-duty when Reserve and National Guard personnel performing inactive duty training (drill). When traveling to and from their home they will be considered off-duty. DoD personnel are on-duty when on temporary duty or temporary additional duty. Personnel on assignment away from the regular place of employment are covered 24 hours a day for any injury that results from activities essential or incidental to the temporary assignment. However, when personnel deviate from the normal incidents of the trip and become involved in activities, personal or otherwise, that are not reasonably incidental to the duties of the temporary assignment contemplated by the employer, the person ceases to be considered on-duty for investigation and reporting purposes of occupational injuries or illnesses. **NOTE 1.** Lunch off the installation is an off-duty event unless the luncheon is required by the job. **NOTE 2.** Injuries sustained by military members working as part-time NAF employees are reported as on-duty military mishaps, even though the members are in off-duty status.

Property damage—Damage of \$10,000 or more to facilities, equipment, or material. Report damage even if the US Government is wholly or partially reimbursed. Damage costs include all costs associated with the mishap, i.e., primary and clean-up (not environmental). The total of the Air Force and non-Air Force damages determines the reportability.

Rated aircrew member—Individuals holding AFSCs (11XX, 12XX, 13XX, 48XX) that identify rated aircrew members serving in or qualified to serve in pilot, navigator, flight test positions, astronaut or flight surgeon.

Recommendations—These are actions likely to prevent a similar mishap or reduce its effects.

Remotely piloted vehicles (RPV)—An unmanned vehicle whose primary maneuvering control is normally provided from a source external to the vehicle itself. A RPV may be used as a target, attack, reconnaissance, ECM, or test bed-carrying vehicle. Full-scale RPVs are aircraft modified to the remotely piloted configuration. Sub-scale RPVs are RPVs that are not full scale.

Training related death—A death associated with a non-combat military exercise or training activity that is designed to develop a military member's physical ability or to maintain or increase individual/collective combat and/or peacekeeping skills. The death is due to either an accident or the result of natural causes occurring during or within one hour after any training activity where the exercise or activity could be a contributing factor.

UNICOM ñ —A nongovernmental communications facility that may provide airport information at certain airports.

Unmanned aerial vehicle (UAV)—All unmanned weight-carrying devices supported in flight by buoyancy or dynamic action and are owned or leased by the DoD Components, to include aerostat balloons, (including Reserve forces and National Guard) that is operated and exclusively controlled or directed by a DoD Component. Includes UAVs furnished by the Government or on bailment to a non-DoD organization for modification, maintenance, repair, test, contract training, or experimental project for a DoD Component, when the Government has assumed ground and flight risk. Also includes UAVs under test by a DoD Component. (This includes UAVs furnished by a contractor or another Government Agency when operated by a DoD crew in official status and a DD Form 250, "Material Inspection and Receiving Report," has been executed to certify that the Department of Defense has accepted the vehicle.)

Unmanned aerial vehicle mishap—An accident involving a UAV but not involving a DoD aircraft.

Attachment 2

PRE-MISHAP PREPARATION

Section A2A—Pre-Mishap Planning Considerations

A2.1. Developing the Base MRP. Use the guidance provided by this pamphlet, AFI 91-202, and AFI 32-4001, *Disaster Preparedness Planning and Operations*, to develop the base MRP. Take the following into consideration:

- A2.1.1. The type, number, and role of aircraft or weapon systems operating from the installation (including deployment of other aircraft types).
- A2.1.2. The geographical location of the installation and the operational flying areas.
- A2.1.3. The proximity of the installation to other flying bases and emergency response services.

A2.2. Recommended Minimum Content. Commanders and their safety staffs should ensure their base Mishap Response Plan (MRP) addresses at least the following considerations as applicable to their local conditions and operating environment:

- A2.2.1. Notifying all pertinent agencies that a mishap has occurred. Include procedures for notification of persons and units, the names and locations of safety investigators, and required reports, including sample formats and addressees. (OPRs: SE and installation command post)
- A2.2.2. Ensuring all investigators are familiar with this and other publications required for effective investigation, reporting, and analysis. (OPR: SE)
- A2.2.3. Planning for the organization of the investigation and general procedures to be followed, including an outline for investigation with tentative delegation of responsibilities for each SIB member (see [Attachment 4](#)). (OPR: SE)
- A2.2.4. Prearranging for vehicles, transport aircraft, or helicopters that may be required to proceed to the scene. (OPR: LG, OG/CC)
- A2.2.5. Identifying heavy-duty equipment to use for wreckage recovery. (OPR: CE)
- A2.2.6. Preparing investigation kits (see [Section A2B](#) below). (OPR: SE)
- A2.2.7. Identifying an alert or on-call photographer. (OPR: SE)
- A2.2.8. Pre-coordinating security arrangements with both base and civil law enforcement personnel. This includes establishing liaison with security forces and local police authorities to ensure prompt reporting of off-base mishaps, adequate traffic control en route to the mishap scene, security at the scene, and help in communicating with people at remote mishap locations (use of police radio nets can initially speed communications). (OPR: SFS)
- A2.2.9. Identifying secure and sheltered locations for wreckage that must be removed from the mishap scene. (OPRs: OSS/ LSS)
- A2.2.10. Designating a central location where people and equipment are to assemble before going to off-base mishap scenes. (OPR: Disaster Preparedness staff)

A2.2.11. Planning communication requirements between the mishap site and support facilities. (OPR: Disaster Preparedness staff)

A2.2.12. Obtaining maps for all concerned with suitable grid or coordinate systems to accurately pinpoint the mishap scene. (OPR: CE)

A2.2.13. Establishing liaison with local news media to ensure understanding of policies governing release of safety information. (OPR: PA)

A2.2.14. Supplying requirements of the SIB and support personnel. (OPR: LG)

A2.2.15. Establishing requirement for Critical Incident Stress Management (CISM) IAW AFI 44-153, *Critical Incident Stress Management* (OPR: MDG)

A2.2.16. Establishing agreements with local coroners/medical examiners clarifying jurisdiction for disposition of remains and procedures for expeditious forensic autopsies (OPR: JA)

A2.2.17. Establishing agreements with local civilian medical treatment facilities for toxicological testing of mishap personnel brought to their facility and access to them for military flight surgeons. (OPR: MDG)

A2.2.18. Planning on provision of medical care for an extended period of time at remote mishap sites. (OPR: MDG)

A2.3. Integration of Supporting Organizations' Responses. The MRP should describe the responsibilities of, or provide checklists for, each operational and support element to which tasks will be assigned or support will be required once initial disaster response has been completed. These may include, but are not limited to:

A2.3.1. The designated on-scene commander.

A2.3.2. Wing/installation safety office.

A2.3.3. All interim safety board members, by position.

A2.3.4. Wing/installation key staff:

A2.3.4.1. Staff Judge Advocate (claims).

A2.3.4.2. Public Affairs Officer.

A2.3.4.3. Chaplain

A2.3.5. Operations Group functions:

A2.3.5.1. Control tower/other air traffic facilities.

A2.3.5.2. Command post.

A2.3.5.3. Base operations.

A2.3.5.4. Weather officer.

A2.3.5.5. Supervisor of flying.

A2.3.5.6. Operational squadrons (esp. helicopter units if assigned).

A2.3.6. Logistics Group functions:

A2.3.6.1. Aircraft recovery teams.

A2.3.6.2. Fuel depot.

A2.3.6.3. Specialty shops (AGE, etc.).

A2.3.6.4. Maintenance Squadrons

A2.3.7. Support Group functions:

A2.3.7.1. Security Forces.

A2.3.7.2. Fire Department.

A2.3.7.3. Readiness Flight.

A2.3.7.4. Search and recovery (SAR)/mortuary affairs team.

A2.3.7.5. Motor pool.

A2.3.7.6. Surveyors.

A2.3.7.7. Duty photographer (Combat Camera).

A2.3.7.8. Information systems officer.

A2.3.7.9. Contracting officer (for immediate local purchases).

A2.3.8. Medical Group functions:

A2.3.8.1. Flight Medicine Clinic.

A2.3.8.2. Bioenvironmental Engineering (for hazardous materials evaluation).

A2.3.8.3. Critical Incident Stress Management

A2.3.8.4. Independent Duty Medical Technicians

A2.3.8.5. Laboratory

Section A2B—Mishap Response Kit Preparation

A2.4. General Information. Safety offices should pre-assemble these kits and keep them ready for immediate use. The safety office is responsible for providing and safekeeping of these kits. Because of the value and attractiveness of many of the items, a member of the investigation team must be responsible for the kit when it is in use. Vary kit items to suit local circumstances; however, the items listed in the following paragraphs reflect typical needs based on past investigation experience.

A2.5. "Community" Kit. This contains items that may be needed by investigators, but are not required to be immediately accessible, and are too bulky or heavy to be conveniently carried. The community kit should be centrally located at the mishap site and contain the following items:

A2.5.1. Survey Equipment:

A2.5.1.1. One thousand feet of light rope or heavy cord, marked at 50-foot intervals.

A2.5.1.2. Twelve inch steel rule.

A2.5.1.3. Fifty lightweight stakes.

A2.5.2. Tools:

- A2.5.2.1. Hammer.
- A2.5.2.2. Chisel.
- A2.5.2.3. Hacksaw with spare blades.
- A2.5.2.4. Small wood saw.
- A2.5.2.5. Small shovel.
- A2.5.2.6. Spray lube.
- A2.5.2.7. Rags or paper towels.
- A2.5.2.8. Hand cleaner.
- A2.5.2.9. Hatchet.

A2.5.3. Miscellaneous Items:

- A2.5.3.1. Scale models of unit aircraft.
- A2.5.3.2. Installation telephone directory and list of local civilian authority addresses and telephone numbers.
- A2.5.3.3. Spare flashlights, batteries, zip lock bags, tags and labels, etc.
- A2.5.3.4. Water jug or cases of drinking water.

A2.6. Contingency Equipment. The following will be needed only under certain conditions. Arrange to have the following items available for issue to investigators when required, and arrange to have the equipment transported to the crash scene:

- A2.6.1. Tents, bedding, rations, cooking gear, toilet paper, hand wash set up, etc.
- A2.6.2. Emergency and portable lighting, portable latrines.
- A2.6.3. Coveralls, boots, parkas, rain suits, and other protective clothing.
- A2.6.4. Emergency funds, foreign currency, if applicable.
- A2.6.5. Axes, machetes, power chain saws, floodlights, and other heavy equipment.
- A2.6.6. Assorted sieves (up to 3-foot square) for sifting evidence from mud, etc.
- A2.6.7. Hydration backpacks, particularly in arid/hot climates.
- A2.6.8. Portable, lightweight means of on-site communications, e.g., field telephones, walkie-talkie sets, loud hailer, etc., and spare batteries.
- A2.6.9. Protective packing materials, containers, plastic bags, sheets, tape, and string for shipping evidence from the site.
- A2.6.10. Crash site access passes.
- A2.6.11. Weather-specific and terrain-specific protective equipment.

A2.7. Witness Interview Equipment. Three or four interview kits are recommended as a minimum, each containing the following:

- A2.7.1. Tape recorder.
- A2.7.2. Videotape Recorder and tripod.
- A2.7.3. Microphone with switch on mike.
- A2.7.4. AC adapter.
- A2.7.5. Audio and Videotapes (60-minute audiotapes maximum to increase durability and resist stretching).
- A2.7.6. Spare batteries.
- A2.7.7. Statement forms.
- A2.7.8. Model aircraft.

A2.8. Photographic Equipment. Most investigations will be fully supported by Combat Camera or other specialist photographers. However, the table of allowance for wing/base safety offices authorizes procurement of photographic equipment. This equipment should be included in the safety office's quick reaction kit to ensure at least minimal initial documentation of a mishap scene:

- A2.8.1. 35 mm SLR camera body with built-in light meter.
- A2.8.2. Macro lens or 50 mm lens with extension tubes or close-up diopters.
- A2.8.3. Electronic flash with extension cord.
- A2.8.4. Small tripod.
- A2.8.5. Locking cable release.
- A2.8.6. Photographic identification board.
- A2.8.7. Photographic log.
- A2.8.8. Spare batteries.
- A2.8.9. Videocassette camera with spare cassettes and batteries. (N/A if available through Combat Camera.)
- A2.8.10. Digital photography is rapidly becoming the standard in the field. Use of a mega pixel or greater camera has proven adequate for limited blow-ups and general documentation as required for Tab S. Digital imagery is also preferable as the reports are moving to all digital. Many Class A final reports have been totally produced electronically, making production of the paper copies easier as well as providing a compact format for transporting the information. Film-based photography is still preferable to digital photography, however, for documentation of human remains (consult AFIP forensic photographer with specific questions). Ensure you have a digital camera, mega pixel or greater resolution w/spare memory and batteries

A2.9. Individual Board Member Kits -- Standard Contents. Mishap sites vary considerably. They may be in mountainous terrain, isolated areas, etc. Wreckage may be confined to a small area or scattered over several ridgelines. Whatever situation, each investigator must have the equipment he or she needs to

work with and be able to operate autonomously. Each investigative specialty (investigative officer, pilot member, life support member, etc.) should have a separate kit. It is literally impossible to conduct a modern investigation without the use of a small computer. Most board members will arrive with a laptop computer. It is imperative that each primary member of the SIB have unlimited access to a computer. All required tabs, forms, and report generation software is available either through the AFSC representative to the board or directly from HQ AFSC/SEF. In addition, all kits should include the following basic equipment:

A2.9.1. Documentation, Measurement, and Calculation Supplies:

- A2.9.1.1. Calculator with trigonometric functions.
- A2.9.1.2. Quad-ruled paper.
- A2.9.1.3. Tape measure (one hundred foot recommended)
- A2.9.1.4. Notebook (a 1/2 steno notebook is very useful--it fits into the hip pocket).
- A2.9.1.5. Plotter (serves as a ruler, protractor, and inclinometer).
- A2.9.1.6. Dividers (useful for transferring measurements).
- A2.9.1.7. Pencils, pens, grease pencils, felt-tip pens (indelible type for anything that may be exposed to moisture).
- A2.9.1.8. Lensatic compass (the more accurate, the better).
- A2.9.1.9. E6-B (CPU-26A/P) computer for wind problems.
- A2.9.1.10. String and plumb bob (turns plotter into an inclinometer).

A2.9.2. Evidence Gathering and Evaluating Equipment:

- A2.9.2.1. Clean containers for fluid samples and evidence.
- A2.9.2.2. Magnifying glasses (5X and 10X).
- A2.9.2.3. Small tape measure.
- A2.9.2.4. Flashlight and batteries.
- A2.9.2.5. Mirrors (dentist's and regular).
- A2.9.2.6. Tags with ties for tagging parts and evidence.
- A2.9.2.7. Labels and 3- by 5-inch index cards.
- A2.9.2.8. Sealable plastic bags (assorted).
- A2.9.2.9. Wrenches (including adjustable).
- A2.9.2.10. Pliers, wire cutters, and vice grips.
- A2.9.2.11. Screwdrivers (several, including both common and Phillips).
- A2.9.2.12. Knife.
- A2.9.2.13. Small stiff and soft bristled brushes.
- A2.9.2.14. Masking tape.

A2.9.3. Miscellaneous Items:

- A2.9.3.1. List of kit contents.
- A2.9.3.2. Small first-aid kit.
- A2.9.3.3. Clipboard.
- A2.9.3.4. Syringes (for gathering fluid samples).
- A2.9.3.5. Large tweezers.
- A2.9.3.6. Wood or metal stakes with tags and marking pens.
- A2.9.3.7. Leather gloves.
- A2.9.3.8. Suntan lotion.
- A2.9.3.9. Latex gloves.
- A2.9.3.10. Dust Masks.

A2.10. Board Member-Specific Kits. The following should be provided to the appropriate ISB members and replenished as necessary upon the arrival of the SIB:

A2.10.1. Board President's Kit:

- A2.10.1.1. AFPAM 91-211 and AFI 91-204 with appropriate supplements.
- A2.10.1.2. Sample safety report forms.
- A2.10.1.3. Telephone list with key numbers.
- A2.10.1.4. Nearest installation telephone directory.
- A2.10.1.5. Technical assistance resource list.

A2.10.2. Investigator/Recorder Kit:

- A2.10.2.1. Two sets of file folders (for draft and final versions of formal report tabs A through Z, including computer disks containing the formal report Tabs) The latest versions of these programs are available from HQ AFSC/SEF.
- A2.10.2.2. Masters or clear copies as masters of safety report cover, index tabs A through Z, releasable blank sheets, and non-releasable blank sheets.
- A2.10.2.3. File folders for inbound and outbound messages (blank message forms and blank duplication forms).
- A2.10.2.4. Telephone log.
- A2.10.2.5. SIB progress chart.
- A2.10.2.6. Maps (grid, country, aviation, road).
- A2.10.2.7. General administration supplies.

A2.10.3. Pilot Member Kit:

- A2.10.3.1. Aircrew standardization and training regulations.

A2.10.3.2. Operational regulations.

A2.10.3.3. Appropriate flight and weapons manuals.

A2.10.3.4. Local area charts and instrument publications.

A2.10.4. Maintenance Officer Kit:

A2.10.4.1. Tools (as required).

A2.10.4.2. Publications. Ensure the base technical order library has copies of all the applicable technical orders for aircraft at your particular installation available for checkout and use. Refer to T.O. 00-5 series for acquiring and handling T.O.s.

A2.10.5. Medical Officer Kit:

A2.10.5.1. Evidence equipment such as body bags, ziplock bags (polyethylene), colored tape, scissors/forceps, and examination gloves.

A2.10.5.2. Administrative materials such as investigation and reporting instructions (AFPAM 91-211, AFI 91-204); assigned aircraft “dash-1” technical orders; AFIP Forms 1323, **AFIP/Division of Forensic Toxicology - Toxicological Request Form**; and SF Forms 523, **Medical Record - Authorization for Autopsy**.

A2.11. “Personal” Kits. Individuals designated as potential board members also need to develop “personal survival kits” to be ready for short-notice travel worldwide. These kits should contain two types of materials: those related to travel for extended periods, and those tailored to prolonged work/living under worst-case field conditions. The best rule of thumb for both of these is to not bring anything you aren’t prepared to carry. Aircraft mishaps do not always happen in convenient places, so put a light-weight backpack at the top of your shopping list, then work from there.

A2.11.1. Administrative Materials:

A2.11.1.1. Expense record (for eventually building your travel voucher).

A2.11.1.2. Orders or authorization to investigate (should be available through recorder; included in formal report Tab Q).

A2.11.1.3. Immunization record (PHS-731). Make sure Hepatitis-B is up to date for any mishap where human remains will be present.

A2.11.1.4. Checkbook and extra checks.

A2.11.1.5. Credit cards (government and personal).

A2.11.1.6. Identification card (DD Form 2) and dog tags.

A2.11.1.7. International or government drivers license (if possessed).

A2.11.1.8. Passport (best to maintain both official and personal).

A2.11.2. Fieldwork Materials:

A2.11.2.1. Sturdy, broken-in boots.

A2.11.2.2. Gloves:

A2.11.2.2.1. Leather.

A2.11.2.2.2. Rubber (kitchen style is fine).

A2.11.2.2.3. Latex (surgical).

A2.11.2.3. Hat -- keeps you cooler in summer (broad-brimmed, floppy hats or pith helmets) and warmer in winter.

A2.11.2.4. Insect repellent.

A2.11.2.5. First-aid kit for minor cuts.

A2.11.2.6. Whistle and small pocket mirror (for communication over medium distances, or to attract attention to a specific location).

A2.11.2.7. Moist towelettes.

A2.11.2.8. Water container(s).

A2.11.2.9. Ear plugs (for investigations near airfields).

A2.11.2.10. Collapsible cup.

A2.11.2.11. Knife, screwdriver, and can opener.

A2.11.2.12. Basic tools (multipurpose pocket tools are excellent for this purpose).

A2.11.2.13. Magnifying glass.

A2.11.2.14. Food bars.

A2.11.2.15. Work clothes and equipment needed for severe weather conditions, i.e., parka, thermal underwear, rain gear, etc.

Attachment 3

WING STAFF, ISB, AND SIB CHECKLISTS

Section A3A—Using This Attachment

A3.1. Introduction. The checklists in [Section A3B](#) and [Section A3C](#) of this attachment are organized according to the six major phases of a safety investigation. However, for the purposes of this attachment, some of the phases are combined for functional convenience:

A3.1.1. Preparation Phase: the ongoing process of maintaining readiness for executing a mishap response plan, including exercises of ISB procedures.

A3.1.2. Notification/ISB Phase: the period from initial notification of a major mishap to the assumption of investigative responsibility by the permanent SIB president. All ISB actions take place during this phase.

A3.1.3. SIB Arrival Phase: the transitional period during which the ISB members familiarize their permanent SIB counterparts with the status of evidence preservation, the condition of the crash site, and other relevant information.

A3.1.4. Investigation/Report Production Phase: the period from initial assembly of factual data to the completion of the formal report and SIB president's outbrief. The ISB supports this phase through collection and protection of perishable evidence.

A3.2. Purpose. This attachment is intended to give individual participants in mishap response and investigation a basic understanding of the tasks they are expected to accomplish. It may be used for initial and refresher training of ISB members, and should form the basis for local development of installation-specific checklists, using AF Form 2519, **All Purpose Checklist** or similar format. All local checklists should contain appropriate organization phone and building numbers, and should be periodically revaluated as a part of Major Accident Response Exercises (MARE).

Section A3B—Wing Staff Checklists

A3.3. Wing Commander Checklist:

A3.3.1. Preparation Phase:

A3.3.1.1. Prepare to provide support personnel and facilities for an SIB as outlined in AFI 91-204.

A3.3.1.2. Coordinate required installation support for a tenant unit mishap with the tenant unit commander.

A3.3.1.3. Ensure a viable MRP is developed. The MRP must be coordinated through the host safety staff. Ensure compliance with AFI 91-202, AFI 32-4004 and Base OPlans.

A3.3.1.4. Ensure the operations group commander, logistics group commander, and medical group commander submit a sufficient number of names of eligible individuals to the wing FSO for training as qualified SIB members. Ensure the eligible individuals are also the ones they really will send if tasked.

A3.3.1.5. Ensure the wing FSO briefs the wing staff concerning the chronological order of actions and the staff officer responsible for the actions.

A3.3.1.6. Ensure the host safety staff coordinates with the appropriate installation units to include an aircraft mishap scenario as one of the scheduled installation exercises to familiarize the battle staff, DCG, DRF, and ISB with their MRP procedures.

A3.3.2. Notification/ISB Phase.

A3.3.2.1. Report to the command post (or other predesignated area).

A3.3.2.2. Obtain a situation briefing from the command post duty controller, OSC, battle staff, and DCG.

A3.3.2.3. Dispatch the first available helicopter with a medical team immediately if mishap site is remote.

A3.3.2.4. Confirm key personnel (OG/CC, LG/CC, MDG/CC, SPTG/CC, COS) are assembled at the command post or assembly area.

A3.3.2.5. Notify the commander of the unit where the mishap aircraft or aircrew is assigned (if applicable).

A3.3.2.6. Ensure response forces are aware of dangerous materials, if aboard, such as nuclear or explosive armament or toxic chemicals, or composite materials i.e., F-16 hydrazine.

A3.3.2.7. Appoint, in conjunction with the OG/CC, LG/CC, MG/CC, and COS, the ISB members from the list of qualified and trained individuals.

A3.3.2.8. Ensure the appointed ISB members assemble at the designated area, assume interim board duties, and terminate all other duties until released by the SIB president.

A3.3.2.9. Direct battle staff, DCG, and ISB to initiate their procedures and checklists.

A3.3.2.10. Initiate casualty notification procedures if applicable. In the event of a fatality, coordinate with the flight surgeon, chaplain, installation personnel officer, mortuary affairs officer, and other necessary personnel (i.e., local pastor, etc.) for a personal visit to relatives of the deceased in the local area (designated on DD Form 93, **Record of Emergency Data**). Accomplish this as soon after the mishap as feasible to preclude possibility of erroneous or thoughtless information from reaching next of kin and causing further distress. For next of kin not located in the local area, coordinate with the casualty reporting services of the installation personnel flight on procedures for notification.

A3.3.2.11. Direct emergency assistance.

A3.3.2.12. Direct community relations aspects of the mishap. Designate authorization to release information to the news media in accordance with AFIs 91-204 and 35-101.

A3.3.2.13. Ensure Public Affairs establishes procedures to handle the flow of information concerning mishaps as outlined in AFIs 91-204 and 35-101, coordinates all requests for photo and news releases, and coordinates with civilian news media personnel.

A3.4. Support Group Commander/On-Scene Commander Checklist:

A3.4.1. Preparation Phase:

A3.4.1.1. Ensure readiness flight develops a viable operations plan according to AFI 32-4001 and coordinates it with the host COS so that procedures are identical or compatible.

A3.4.1.2. Incorporate an aircraft mishap scenario as one of the scheduled major accident response exercises to familiarize the battle staff, DCG, DRF, and SIB with their MRP procedures.

A3.4.1.3. Use critiques of the exercises to find and correct deficiencies.

A3.4.1.4. Comply with all requirements of AFI 91-204.

A3.4.1.5. Be familiar with the following publications:

A3.4.1.5.1. AFI 32-4001, *Disaster Preparedness Planning and Operations*.

A3.4.1.5.2. Local Base, *Aircraft Mishap Response Plan*.

A3.4.1.5.3. AFI 44-153, *Critical Incident Stress Management (CISM)*

A3.4.2. Notification/ISB Phase. (Member of initial support element.) Obtain situation briefing from the duty controller while en route to the mishap site.

A3.4.2.1. If on base or near base, report as prescribed by the Disaster Preparedness Operations Plan.

A3.4.2.2. If off base remote, report directly to assembly point and determine, in coordination with the wing commander, whether to take a helicopter to the site or to lead a convoy of the members of the initial, follow-on, and support elements to the mishap site. Obtain exact directions to the mishap site before convoy departure.

A3.4.2.2.1. Ensure security forces advise state and local law officers when off-base convoy response is required or civil involvement exists.

A3.4.2.2.2. Ensure emergency response agencies initiate mutual support agreements.

A3.4.2.2.3. Coordinate with the command post to obtain helicopter support (if available) for airlift to the mishap site.

A3.4.2.3. Approach the mishap site from upwind and from other than the impact direction to avoid smoke or toxic vapors and to avoid destroying evidence.

A3.4.2.4. Consult with bioenvironmental engineer to ensure hazards in the mishap site environment are identified and appropriate personal protective equipment is used by all responders

A3.4.2.5. Deploy personnel to walk in front of vehicles and search for injured survivors hidden from the driver's view by underbrush or tall grass.

A3.4.2.6. Ensure personnel accomplish the tasks described in general in this plan but described in detail in the Base Disaster Preparedness Operations Plan and implementing checklist.

A3.4.2.6.1. Fire department begins rescue of survivors and fire fighting operations.

A3.4.2.6.2. Medical personnel treat and evacuate survivors and injured.

A3.4.2.7. Assume on-scene command and control of the scene after coordinating with the fire chief to determine survivors were rescued and the fire is extinguished.

A3.4.2.8. Determine the location of the mishap and transmit the coordinates to the installation command post.

A3.4.2.9. Determine which members of the follow-on or support elements are required, and direct them to convoy to the mishap site.

A3.4.2.10. Direct security personnel to establish a cordon around the mishap site, and establish an entry control point upwind from the site.

A3.4.2.11. Direct readiness flight personnel to establish a mobile on-scene command post and communications net with the installation.

A3.4.2.12. Direct public affairs personnel to prepare and coordinate news releases. News releases may be made through command post PA representatives versus the on-scene PA representative.

A3.4.2.13. Direct EOD personnel to "safe" or remove all explosive cartridges, initiators, and weapons ordnance after fire fighting operations have ceased.

A3.4.2.14. Direct maintenance personnel to deflate tires to prevent explosion, if applicable.

A3.4.2.15. Ensure all exposed fatalities are covered.

A3.4.2.16. Ensure all potential classified equipment or information is covered.

A3.4.2.17. Coordinate actions of the military, public, and members of the press.

A3.4.2.18. Brief all personnel at the site concerning the following standard policies:

A3.4.2.18.1. Use extreme courtesy when talking to the public or news media personnel. Each individual's conduct must enhance rather than degrade community relations.

A3.4.2.18.2. Abstain from any speculation as to the cause of the mishap.

A3.4.2.18.3. Refer all questions from the public or news media to the PAO.

A3.4.2.18.4. Politely direct members of the news media to contact the installation PAO.

A3.4.2.18.5. Direct potential claimants to the installation claims officer, who will assist them in getting reimbursed for their losses.

NOTE: If the potential claimant has an obviously valid claim, USAF image is enhanced by ensuring the claims officer goes to the claimant rather than forcing the civilian to try and contact the claims officer. That's frustrating even for someone in the USAF. It is helpful for the SIB president to have a feeling for what the claims officer can and cannot do in accordance with AFI 51-502, *Personnel and Government Recovery Claims*. Basic policy is to settle claims promptly and fairly. Anything else hurts the image and the investigation. There is, incidentally, a claims response team at HQ USAF/JA that can deploy to the scene of real disasters to help out--if someone remembers to tell them.

A3.4.2.18.6. Politely ask civilians and news media personnel not to photograph deceased personnel.

A3.4.2.18.7. Politely ask civilians and news media personnel not to photograph classified equipment or information. If they persist, do not try to stop them, but simply inform them that it is a criminal offense for anyone to photograph, publish, or refuse to surrender classified information to proper military authorities.

A3.4.2.18.8. Restrict entry to the cordoned mishap scene to authorized personnel only.

A3.4.2.19. Photograph the remains if the wreckage must be disturbed for removal.

A3.4.2.20. Ensure security and preservation of wreckage in original state to preclude further injuries or loss of evidence.

A3.4.2.21. Accomplish the following actions if the wreckage must be removed immediately:

A3.4.2.21.1. Record, photograph, etch, diagram positions of actuators, cockpit instruments, switches, and impact areas, as applicable, and list location when tagging components in the wreckage.

A3.4.2.21.2. Photograph the position and components of the wreckage as well as the impact areas.

A3.4.2.21.3. Obtain fuel, oil, hydraulic, and oxygen samples, if possible.

A3.4.2.21.4. Inform crash removal crews they may begin removing the wreckage after all actions are complete, if applicable.

A3.4.2.21.5. Ensure Critical Incident Stress Management services are available on site and on base for all responders.

A3.4.2.21.6. Monitor emergency assistance to civilians and next of kin to ensure they receive adequate help and information.

A3.4.3. SIB Arrival Phase:

A3.4.3.1. Transfer control of the mishap wreckage to the SIB president.

A3.4.3.2. Ensure quarters and transportation are available for inbound SIB members.

A3.4.3.3. Maintain readiness flight personnel, mobile command post, communications net and security at the site. Coordinate with the SIB president when deleting these requirements.

A3.4.3.4. Provide a civil engineering team to survey the site and draft the wreckage diagram if requested by the SIB.

A3.4.3.5. Relieve support group SIB members from normal duties for the duration of the SIB.

A3.4.3.6. Appoint a contracting officer to be at the disposal of the ISB and SIB as soon as practical. This individual should subsequently report to the ISB and SIB presidents to ensure investigative and support requirements can be obtained in the field, as necessary.

A3.4.3.7. After wreckage is cleared, ensure cleanup of the mishap site is completed. The site should be restored to its original condition and transferred back to its rightful owner as soon as practical.

A3.4.3.8. Provide additional assistance, as necessary.

A3.5. Operations Group Commander Checklist:

A3.5.1. Preparation Phase. Participate in MRP and MAREs.

A3.5.2. Notification/ISB Phase. (Member of battle staff or DCG.) OG/CC reports to the command post unless otherwise directed.

A3.5.2.1. Obtain a situation briefing from the command post duty controller, OSC, and other battle staff members and alert key wing and tenant unit personnel.

A3.5.2.2. Coordinate and ensure transmission of the OPREP-3.

A3.5.2.3. Ensure the command post maintains a log of all information and actions pertaining to the mishap.

A3.5.2.4. Coordinate helicopter support (if available) for search and rescue operations as well as transportation of the initial support element, ISB and/or SIB to the mishap site.

A3.5.2.5. Alert installation weather detachment to take an immediate observation and impound copies of actual and forecast weather records given to the crew of the mishap aircraft. Request the detachment forward this data to the command post for delivery to the OG/CC, ISB and/or SIB.

A3.5.2.6. Direct the squadron commander of the mishap crew to impound the following records and forward them to the command post for delivery to the OG/CC, ISB and/or SIB:

A3.5.2.6.1. Individual flight records with Flying History Report; total time; time last 30, 60, and 90 days; sorties last 30, 60, and 90 days; and date of last check ride closed out. **NOTE:** Ensure flight records not already processed are included in calculating time of sorties.

A3.5.2.6.2. Flight Orders: Local flight orders, local flight clearance, and, flight plan.

A3.5.2.6.3. Weather Briefing: Squadron weather flimsy and DD Form 175-1, **Flight Weather Briefing**.

A3.5.2.6.4. Flight Records: Student grade folder (if applicable), training record (if applicable), Flight Evaluation Folders (FEF), weapons qualification record, FCIF, and crew rest history.

A3.5.2.6.5. Weapons Crew Records (if applicable): Standardization and evaluation records and training records.

A3.5.2.7. Select, in coordination with COS, and nominate to WG/CC the IO, pilot and life support members for the ISB from the available trained individuals, and alert them to assemble at the preplanned point.

A3.5.2.8. Relieve operations group SIB personnel of normal duties until completion of investigation or release by the SIB president.

A3.5.2.9. Advise operations group personnel involved in the mishap (crew, squadron commander, supervisor of flying, runway supervisory unit officer, etc.) that they will probably have to give witness-type testimony to the SIB when they arrive at the mishap scene.

A3.5.2.10. Forward available information to the WG/CC or the ISB president and COS for the 8-hour preliminary report.

A3.5.2.11. To provide continuity, retain for as long as feasible, the same command post duty controller who was on duty when the mishap occurred. Thoroughly brief replacements and augmentees.

A3.5.2.12. Alert the flight facilities and communications squadron commander to impound the tower and approach control tapes and prepare a transcript according to regulations (if applicable to the mishap).

A3.5.2.13. Alert the FAA ATC facilities to impound voice tapes and radar tape duplications (if applicable to the mishap).

A3.5.2.14. Help the WG/CC notify next of kin (if desired) in the event of fatality or injury to personnel.

A3.5.3. SIB Arrival Phase:

A3.5.3.1. Provide a copy of the command post log and any ramp surveillance videotapes to the SIB.

A3.5.3.2. Support the SIB with sorties for flight-path reenactment and simulator sorties as necessary.

A3.6. Logistics Group Commander Checklist:

A3.6.1. Preparation Phase:

A3.6.1.1. Participate in MRP exercises.

A3.6.1.2. Place EOD personnel on 24-hour call.

A3.6.2. Notification/ISB Phase. (Member of battle staff or DCG.) Report to the command post unless otherwise directed.

A3.6.2.1. Evacuate or protect aircraft or other systems close to the mishap site according to standard maintenance procedures.

A3.6.2.2. Obtain a situation briefing from the command post controllers, OSC, battle staff, or DCG, and alert the key wing and tenant unit personnel.

A3.6.2.3. Impound all ground equipment that may have played a role in the mishap sequence. Do not release this equipment until convinced it was not involved in the mishap or until the SIB president releases it.

A3.6.2.4. Obtain fuel, oil, hydraulic, and oxygen samples (one pint minimum) from units that last serviced the mishap aircraft. Label these samples with cart or truck number and date and time taken. Get mishap aircraft tail number if applicable.

A3.6.2.5. Identify all personnel who serviced the aircraft within the preceding 24 hours in case they are called in by the ISB for toxicological testing.

A3.6.2.6. Direct maintenance personnel to impound maintenance and engine records and deliver them to the command post or the ISB or SIB.

A3.6.2.7. In coordination with COS, select and nominate to the WG/CC the maintenance and egress members for the ISB from the available trained individuals, and tell them to assemble at the command post.

A3.6.2.8. Relieve logistics group personnel of normal duties until completion of investigation or release by the SIB president.

A3.6.2.9. Prepare a list of logistics group personnel involved in the mishap (crew chief, team chief, line chief, etc.), and deliver it to the ISB or SIB.

A3.6.2.10. Coordinate the following through EOD personnel:

A3.6.2.10.1. Dispatch personnel and equipment, as necessary, to base operations to convoy to the mishap site as part of the support element.

A3.6.2.10.2. Obtain information concerning the type and amount of explosive cargo.

A3.6.2.10.3. Evaluate hazardous cargo, determine the best course of action, and advise the OSC.

A3.6.2.10.4. Perform procedures to either disarm or remove potential explosive ordnance, cartridges, and systems at the mishap site.

A3.6.2.10.5. Notify the OSC, ISB, or SIB president when the mishap site is safe.

A3.6.2.11. Coordinate with crash reclamation personnel. If the mishap occurs in a location that requires immediate removal of the wreckage, obtain permission from the OSC, ISB or SIB president to remove the wreckage. Be extremely careful to preserve wreckage in as close to the original condition as possible.

A3.6.3. SIB Arrival Phase. Support the SIB with personnel and equipment for the duration of the investigation.

A3.7. Chief of Safety Checklist:

A3.7.1. Preparation Phase:

A3.7.1.1. Ensure safety office personnel develop a viable MRP, and coordinate this plan with the civil engineering Readiness Flight (RF) or equivalent so that procedures are identical or compatible.

A3.7.1.2. Coordinate with RF to include a mishap scenario as one of the scheduled RF exercises to familiarize the battle staff, DCG, DRF, and SIB with MRP procedures.

A3.7.1.3. Use critiques of the exercises to find and correct deficiencies.

A3.7.1.4. Coordinate MRP responsibilities, authority, and procedures with tenant units to ensure proper support if a tenant is involved in a mishap.

A3.7.1.5. Maintain sample message formats and addresses for address indicating groups (AIG) or Defense Messaging System (DMS), as required, for reporting mishaps.

A3.7.1.6. Maintain a list of trained personnel who can serve as SIB members. Include, on the safety roster only, home phone numbers for recalling personnel and service numbers for publishing orders on short notice. Update the list periodically, and train replacement personnel.

A3.7.1.7. Place a safety officer on 24-hour alert duty to perform the safety procedures and checklist in response to a mishap.

A3.7.1.8. Comply with all requirements in AFI 91-204.

A3.7.2. Notification/ISB Phase:

A3.7.2.1. On Base or Near Base: Take extra copies of the MRP, report directly to command post, and obtain a situation briefing from the duty controller. Dispatch safety officer to the mishap site with portable tape recorders, investigation kit briefcases, tool kit, and the safety truck.

A3.7.2.2. Off Base Remote: Take extra copies of the MRP, report directly to command post, and obtain a situation briefing. Dispatch safety officer with portable tape recorders, mishap kit briefcases, tool kit, and safety truck to base operations for helicopter transport to the site as part of the initial support element or, if this is not possible, to convoy to the site.

A3.7.2.3. Obtain a situation briefing from the command post duty controller or designated individual.

A3.7.2.4. Help the WG/CC initiate the MRP, and help monitor its progress using these checklists.

A3.7.2.5. Help the WG/CC, ISB, or SIB president initiate and monitor the preparation, coordination, and transmission of messages.

A3.7.2.6. Determine external alerting requirements (FAA/NTSB/NON-USAF DOD). Coordinate with USAF Operations Center, DSN 227-6103, or through MAJCOM channels as required.

A3.7.2.7. Ensure commander and staff of the organization or tenant unit that experienced the mishap are alerted to respond to the command post.

A3.7.2.8. Ensure photographic support is alerted and available.

A3.7.2.9. Coordinate with wing commander and group commanders to select ISB or SIB members from the list of trained personnel.

A3.7.2.10. Brief ISB members concerning their duties. Identify individual procedures and checklists.

A3.7.2.11. Help the ISB president or investigator prepare, coordinate, and transmit the preliminary message within 8 hours of the mishap.

A3.7.2.12. Coordinate with public affairs and personnel on news release and casualty messages to avoid release of privileged information.

A3.7.3. SIB Arrival and Investigation/Report Production Phases:

A3.7.3.1. Serve as single point of contact for all SIB requests.

A3.7.3.2. Coordinate with the ISB to brief the SIB on actions completed and information obtained.

A3.8. Medical Group Commander Checklist:

A3.8.1. Preparation Phase:

A3.8.1.1. Become familiar with the Local Base MRP, especially the MDG/CC procedures and checklist.

A3.8.1.2. Participate in MRP and major accident response exercises.

A3.8.1.3. Ensure medical personnel and equipment maintain a 24-hour on-call status.

A3.8.1.4. Ensure relevant agreements are in place with local coroner/medical examiner regarding disposition of remains both on and off-base

A3.8.1.5. Ensure that the Occupational Health Working Group has included the search and recovery team in the Bloodborne Pathogens program IAW AFI 34-242, *Mortuary Affairs Program*.

A3.8.1.6. Ensure agreements are in place with local civilian medical facilities to enable expeditious toxicological testing and flight surgeon access to survivors brought to those facilities.

A3.8.2. Notification/ISB Phase:

A3.8.2.1. Report to the command post unless otherwise directed.

A3.8.2.2. Obtain a situation briefing from the command post duty controller, OSC, battle staff, or DCG members.

A3.8.2.3. Ensure all flight medicine personnel, Independent Duty Medical Technicians (IDMT) and on call personnel in bioenvironmental engineering, radiology and laboratory are alerted.

A3.8.2.4. Ensure all survivors receive appropriate medical care.

A3.8.2.5. Ensure bioenvironmental engineering assesses the mishap site for hazards and proposes appropriate personal protective equipment.

A3.8.2.6. Take prescribed samples, and order accomplishment of required toxicological tests.

A3.8.2.7. Impound crew medical and dental records, and deliver them to the ISB Medical Member. Also, sequester any crew mental health records, substance abuse records, or family advocacy records; inform ISB/SIB flight surgeon if any are present.

A3.8.2.8. Select, in coordination with COS, and nominate to WG/CC the medical members for the ISB from the available trained individuals, and tell them to prepare to assemble.

A3.8.2.9. In case of both survivors and fatalities, or multiple survivors or fatalities, consider recommending to the WG/CC or ISB president assigning two or more Flight Surgeons to the ISB. One to care for the survivors, the others to deal with the field work and fatalities.

A3.8.2.10. Relieve medical group ISB and SIB personnel of normal duties until completion of investigation or release by the ISB or SIB president.

A3.8.2.11. Ensure medical care is provided for all personnel at the mishap site.

A3.8.3. SIB Arrival and Investigation/Report Production Phases:

A3.8.3.1. Provide medical support for the SIB. Responding flight surgeons quite often become members of the ISB and, in rare cases, the ISB flight surgeon may be carried forward into the permanent SIB. The responding flight surgeons are quite heavily tasked caring for survivors, identifying and preserving medical evidence and coordinating the life science component of the investigation. It is generally advised to use IDMTs or other non-flight surgeons to provide medical care on site.

A3.8.3.2. Alert bioenvironmental engineering of suspected hazardous substances.

A3.9. FSO Procedures and Checklist:

A3.9.1. Preparation Phase. Develop a viable MRP. Coordinate this plan with readiness flight so that procedures are identical or compatible.

A3.9.2. Notification/ISB Phase:

A3.9.2.1. On Base or Near Base: Take portable tape recorders, mishap kit briefcases, tool kit, and the safety truck, and report directly to the mishap site or predesignated area.

A3.9.2.2. Off Base Remote: Take portable tape recorders, mishap kit briefcases, tool kit, and the safety truck, and report directly to command post.

A3.9.2.3. Ensure the ISB is forming. If possible dispatch a second FSO to the scene to advise the OSC on evidence protection and critical early actions. An organized, knowledgeable FSO is vital

to the success of the handoff between the OSC and the ISB president, and between the ISB and SIB presidents.

NOTES:

1. If only one safety officer is available, report to the command post, since it is essential that safety personnel help the WG/CC direct and monitor the progress of the command post and base procedures in the initial phase. The OSC can direct and monitor the progress of the on-site procedures in the initial phase.
2. Frequently the FSO is the ISB safety officer. Whether operating in that capacity, or as an advisor to the ISB, the FSO should be ready to provide the following support:

A3.9.2.4. Assist the ISB president, as required.

A3.9.2.5. Help obtain eyewitness statements using the portable tape recorder, witness statement worksheet, and “memory jogging” questions.

A3.9.2.6. Be ready to begin investigation after the site is safe and secure and the mobile command post and communications nets are operating.

NOTE: Climatic conditions of rain or snow may make it impossible for the SIB to record evidence if photos are not taken immediately.

A3.9.2.7. Brief all personnel concerning their roles and the critical nature of a mishap investigation.

A3.9.2.8. Obtain witness statements.

A3.9.2.9. Ensure pilot member records cockpit switch positions and instrument indications.

A3.9.2.10. Ensure maintenance officer:

A3.9.2.10.1. Obtains fuel, oil, hydraulic and oxygen samples (one pint minimum) from the aircraft systems, if possible.

A3.9.2.10.2. Begins identifying and tagging pertinent parts for the wreckage diagram.

A3.9.2.11. Ensure medical officer performs appropriate tests on aircrew survivors and relevant ground personnel. Also ensure that the medical officer and manages any fatalities.

A3.9.2.12. Transmit pertinent information to the command post for COS use in the preliminary report.

A3.9.3. SIB Arrival Phase:

A3.9.3.1. Brief ISB or SIB on status of required actions.

A3.9.3.2. Assist SIB as needed.

Section A3C—Interim Safety Board Member Objectives and Procedures**A3.10. General.**

A3.10.1. Interim boards do NOT “solve” mishaps. However, efficient accomplishment of interim board tasks makes permanent boards more effective, and contributes greatly to the SIB’s ability to establish useful findings, causes, and recommendations. If necessary, the checklists in [Attachment 4](#)

may be used as a guide to the kinds of information that will ultimately be needed by the SIB. However, if ISB members use SIB member checklists for this purpose, the partially completed checklists are to be provided to their SIB counterparts during the SIB arrival phase; ISB members are not to keep copies for themselves, and are not to offer any theories, conjecture, or conclusions they have developed as they hand off the materials and information they have assembled unless specifically asked. The ISB's function can be summed up in three bullets:

A3.10.1.1. Preserve evidence.

A3.10.1.2. Identify witnesses.

A3.10.1.3. Gather factual data.

A3.10.2. Preparation Phase. Wing/group safety staffs should:

A3.10.2.1. Identify and train multiple potential ISB members for all board positions, ensuring pilot members qualified in all locally assigned aircraft are available.

A3.10.2.2. Ensure pre-mishap planning is up-to-date, all required equipment is readily available, and a suitable workcenter has been identified.

A3.10.2.3. Periodically exercise the ISB process, preferably in conjunction with a MARE.

A3.10.3. Notification/ISB Phase. Wing/group safety staffs should:

A3.10.3.1. Ensure the wing/group commander selects and appoints an appropriately tailored ISB immediately upon notification.

A3.10.3.2. Ensure a workcenter is established, preferably in the same location as will be used by the permanent board, as quickly as possible.

A3.10.3.3. Work with the On-Scene Commander to restrict access and minimize disturbance to the scene once it has been declared safe.

A3.10.3.4. Make the gathering and preservation of physical and documentary evidence an absolute priority, followed by testimonial evidence as practical based on the circumstances of the mishap and the availability of ISB resources.

A3.10.3.5. Provide for a 24-hour point of contact for the ISB.

A3.10.4. SIB Arrival Phase. Wing/group safety staffs should:

A3.10.4.1. Ensure maximum possible support is provided to the incoming SIB, including transportation, billeting, personal and professional equipment, and workspace.

A3.10.4.2. Arrange an orderly transition of custody of evidence and information gathered through both mass briefings to the entire SIB and one-on-one briefings conducted by their ISB counterparts, as appropriate.

A3.10.4.3. Orient the SIB members to the installation and the crash site as quickly as possible.

A3.10.4.4. Ensure ISB members withdraw promptly and finally when relieved by their SIB counterparts.

A3.11. Interim Safety Board President. In most cases, the ISB president will be the Operations Group commander of the mishap or supporting wing. For this reason, it is not a good idea to try to combine the

duties of On-Scene Commander (OSC) and ISB president into a single individual. The OSC is usually the supporting Support Group Commander. OSCs are specially trained and legally responsible to state and federal authorities for controlling accident sites, and need to spend the bulk of their time taking care of business at the mishap scene. By contrast, an effective ISB president is primarily a manager of those actions necessary to gather and preserve evidence, much of which is not at the crash scene. Moreover, if the aircrew involved in the mishap is from the ISB president's base, the ISB president must also perform duties associated with command, such as next of kin notification. The following guidelines are recommended for ISB presidents as a means of managing workload and ensuring critical investigation-related tasks are satisfactorily accomplished:

A3.11.1. Preparation Phase. Become familiar with the responsibilities of the other interim board members.

A3.11.2. Notification/ISB Phase. Ensure the following tasks are accomplished as soon as possible, preferably in the order given:

A3.11.2.1. Initiate ISB notification if not previously accomplished by the Crash Net, Chief of Safety or Command Post. ISB members should be directed to report to the ISB president's office or a designated workcenter as prescribed in the base MRP.

A3.11.2.2. Ensure ISB members understand their initial responsibilities (see individual member checklists below); set a proposed time for the first group meeting of all ISB members (preferably 4-6 hours after initial notification).

A3.11.2.3. Ensure the OSC has established strict control over the mishap scene as soon as containment and control actions are complete; set up a procedure for providing him/her a list of personnel authorized access for investigative purposes.

A3.11.2.4. In case of both survivors and fatalities consider assigning two Flight Surgeons to the ISB. One to care for the survivors, the other to deal with the field work and fatalities

A3.11.2.5. Consider calling in for toxicological testing all personnel who serviced the aircraft in the past 24 hours. Note: this is perishable evidence.

A3.11.2.6. Ensure the Readiness Flight and/or fire chief record, as possible, damage to and relocation of parts resulting from fire fighting and rescue operations.

A3.11.2.7. Ensure the ISB safety officer has taken steps to initiate plotting of the wreckage (if dispersed) and arranged for aerial photography if appropriate.

A3.11.2.8. Initiate required operational and safety reports.

A3.11.2.9. Initiate planning for removing wreckage, if required.

NOTE: Except for the CVR, CSFDR and other data recording devices, do not move any part of the wreckage unless absolutely necessary, i.e., on a runway, highway, railroad track, etc. Coordinate with convening authority and/or SIB president, if in doubt.

A3.11.3. SIB Arrival Phase:

A3.11.3.1. Stay abreast of travel plans of permanent SIB members, especially the SIB President.

A3.11.3.2. Ensure workspace and billeting arrangements are in place for all expected out-of-town board members.

A3.11.3.3. Prepare a “handoff briefing” containing at least the following information:

- A3.11.3.3.1. Location/condition of the accident scene, including collateral property damage.
- A3.11.3.3.2. Actions taken by emergency response forces that affected the scene or wreckage.
- A3.11.3.3.3. Location/condition of participants/survivors, including any bystanders killed/injured; include:
- A3.11.3.3.4. Status of toxicological testing, autopsies, etc.
- A3.11.3.3.5. Next-of-kin notification status.
- A3.11.3.3.6. Location/condition/status of wreckage, including all classified equipment (is there pressure to move?).
- A3.11.3.3.7. Presence of munitions, composites, or other hazardous materials at scene (including potential for blood borne pathogens based on presence of human remains).
- A3.11.3.3.8. Civil authorities involved in managing scene/casualties.
- A3.11.3.3.9. Status of records impoundment actions (refer to individual ISB member guidelines below for list).
- A3.11.3.3.10. Status of witness search/statement collection.
- A3.11.3.3.11. Reports issued to date.
- A3.11.3.3.12. Technical assistance immediately available/offered/en route.
- A3.11.3.3.13. Media interest/statements made to date.
- A3.11.3.3.14. Logistical arrangements in place for permanent board (workcenter, communications, transportation, billeting, personal equipment, etc.).

A3.12. ISB Investigating Officer. A trained flight safety officer whose principle function is to ensure preservation of physical evidence at the scene of the mishap and is the ISB counterpart of the SIBís investigating officer. In most cases, the ISB IO will be the first trained safety officer to reach an accident scene. Installations with more than one full-time FSO assigned should ensure that the individual designated as the ISB IO is conveyed to the scene as quickly as possible, and that a second FSO is assigned to help the ISB president perform his/her initial duties as quickly as possible. If only one full-time FSO is customarily on station at any given time, local ISB checklists must be constructed in sufficient detail to allow other ISB members to work autonomously, freeing up the FSO to go to the scene as quickly as possible. This is particularly important in the area of witness identification and initial interviews, since only those individuals officially appointed as ISB members should be involved in that process.

A3.12.1. Preparation Phase:

- A3.12.1.1. Ensure all potential ISB members are trained in accordance with MAJCOM criteria.
- A3.12.1.2. Periodically perform table-top exercises of portions of the base mishap response plan; for example:
 - A3.12.1.2.1. Check phone number list for currency.
 - A3.12.1.2.2. Confirm previously assembled supplies are ready to go.

A3.12.1.2.3. Simulate a downing of an aircraft currently on a sortie; have crewmember and aircraft records set aside.

A3.12.1.3. Visit maintenance shops to develop familiarity with the appearance of specific components of your aircraft separate from the rest of the airplane.

A3.12.1.4. Work with the Readiness Flight and security forces staffs to prepare special badges for DRF and SIB members; store and remain accountable for them until needed.

A3.12.2. Notification/ISB Phase. The following tasks are divided into two groups: those that are associated with wreckage and the crash scene itself, and those that may need to be conducted either at or well away from the scene.

A3.12.2.1. Actions to be Taken at the Crash Site. Actions taken at the crash site are to some extent dependent upon whether the mishap is a takeoff mishap, landing mishap, or a mishap away from the airfield. However, regardless of the site's location, the following actions should be considered and accomplished in order to the maximum extent practical:

A3.12.2.1.1. Proceed to the mishap site; ensure the area is adequately guarded and all explosives are being identified and made safe, including ejection seat cartridges, tip tank ejectors, tires, and munitions. Photograph the wreckage "as found" before disturbing it. If security forces have not established access rosters to help control the scene, ask them to do so.

A3.12.2.1.2. Determine the extent and disposition of aircrew or civilian casualties, along with the names and addresses of all fatalities.

A3.12.2.1.3. Try to keep surviving aircrew separated until they have been examined by the flight surgeon and initial interviews are conducted. The accuracy of their statements can be degraded by conversation about the mishap events between themselves.

A3.12.2.1.4. Once the site is declared safe, make an initial walkthrough of the scene to familiarize yourself with its general configuration. By moving through the area slowly and evaluating aircraft parts and impact angles, it is usually possible to determine the actual path of the aircraft from initial impact to the point where it came to rest.

A3.12.2.1.5. Document the condition of the wreckage and the site as soon as possible; take comprehensive photographs (and video, if available) of all damage and components. (See **paragraph A3.11.2.3.** for photographic priorities.) Account for all major structural components if possible. Since rescue and investigation efforts in inclement weather may obliterate ground scars, take the following types of photos as soon as possible:

A3.12.2.1.5.1. Required photos of fatalities (interim medical member has priority for all photographic resources until this step is complete).

A3.12.2.1.5.2. Initial ground impact marks, such as ground tree scars, and broken branches (record where and when each photo was taken). A mixture of black and white (B/W) and color photography is generally best, since B/W captures contrasting details well, while color permits detailed analysis that could prove helpful once the site is disturbed. For example, presence of green glass in the initial ground scar might indicate that the right wing impacted first if the glass is from the wing light.

A3.12.2.1.5.3. Aerial photos (if practical). Discolorations of the terrain caused by fire patterns, fluid sprays, etc. can be valuable information, and may also be used to plot wind direction at the time of the mishap.

A3.12.2.1.6. Make a preliminary wreckage diagram sketch showing a tentative ground track and major components; note critical distances and compass angles from references (roads, easily recognized terrain features, etc. As a rule of thumb, you should request a civil engineering survey of sites larger than 100' x 100', particularly if weather or mission requirements will significantly change the mishap scene before the permanent investigation board will arrive. If parts are strewn over a large area, it's essential to keep track of exactly where all are found in relation to the main part of the wreckage. If local residents report components on their property, ask them not to move them; get a photographer out to document the component's position and condition as quickly as possible. If residents bring aircraft parts to the crash site or supporting installation, ask them to indicate on a large-scale map exactly where the part was found.

A3.12.2.1.7. If power is still available to the aircraft, ensure cockpit voice and crash data recorders are off so the systems do not overwrite critical mishap evidence. Consider removing these recorders to a safe, secure area to prevent further damage from the elements. For CVRs, CSFDRs, ejection seat-mounted recording devices, or any other flight data memory units, use the following procedures:

A3.12.2.1.7.1. If the unit is still attached to the aircraft, disconnect power (if applied), and do not reapply power (aircraft, battery, or auxiliary) to the unit. In a substantially intact large-frame aircraft (tanker, cargo, etc.), pull all recorder related circuit breakers ASAP.

A3.12.2.1.7.2. Store the unit in a plastic bag, preferably static safe.

A3.12.2.1.7.3. Do not attempt to disassemble or power up the unit.

A3.12.2.1.7.4. Do not handle the connector.

A3.12.2.1.7.5. If the unit is immersed in water (salt or fresh), store and transport it fully immersed in the same water until delivered for data download/decompression.

A3.12.2.1.7.6. Protect, in the same manner, any personal recording devices such as video cameras or tape recorders recovered at the scene.

A3.12.2.1.8. A permanent SIB will arrive at some point to take charge of the investigation; to preserve the scene for their examination, consider the following:

A3.12.2.1.8.1. Do not disturb the scene any more than is necessary to recover the injured and fully document the location of all casualties and major components.

A3.12.2.1.8.2. Take reasonable steps to protect key pieces of evidence, such as covering initial ground scars and cockpit areas during inclement weather.

A3.12.2.1.8.3. Stake, mark, photograph, and record (as applicable) small items that could be blown away, lost in mud or water, or covered with snow or blowing sand.

A3.12.2.1.8.4. Ensure that the interim maintenance member has a qualified technician draw fluid and gas samples if the integrity of their associated systems is in doubt.

A3.12.2.1.9. If the mishap occurred in an area that must be cleared immediately, such as a busy freeway or a housing area, an initial walk-through and the initial photographs and video tape may be the only chance anyone has to view some of the wreckage in its original condition. If the wreckage must be removed immediately, record, photograph, etch, and diagram positions of actuators, cockpit instruments, switches, and impact areas as applicable, and list their location in the wreckage when tagging components.

A3.12.2.1.10. Make notes of or tape record general impressions. These impressions can be useful in developing questions for witnesses, or for evaluating a witness' testimony.

A3.12.2.1.11. If time permits, begin making general observations about the wreckage as follows:

A3.12.2.1.11.1. General structural integrity (presence of all major components).

A3.12.2.1.11.2. Position of flaps, slats, landing gear, ailerons, rudder, elevators, and speed brakes/spoilers.

A3.12.2.1.11.3. Condition of engines (rotational damage, visible signs of in-flight fire, post-impact fire or scorching suggestive of high temperature, etc.) and afterburner nozzle position.

A3.12.2.1.11.4. Helicopter rotor system condition (all main and tail rotor blades accounted for, main rotor attached to mast, uniform damage to tail rotor blades).

A3.12.2.1.11.5. Position of all cockpit switches, lighting controls, throttles, and landing gear, flap, speed brake and thrust reverser levers.

A3.12.2.1.11.6. Presence of fuel (spillage, fire propagation, etc.).

A3.12.2.1.11.7. Instrument indications at time of impact.

A3.12.2.2. Non-Wreckage-Related Actions. ISB safety officers or their designated representatives should spearhead the search for useful witnesses. Look for both "participants" and "observers" as described in [Chapter 7](#). Bear in mind that, except in the case of persons who are unlikely to be available to the permanent board, ISB members should usually restrict their efforts to taking written statements and gathering personal identifying and contact information for the permanent board's use. This process should be tailored to the specific type of mishap (takeoff, landing, or away from airfield) as follows:

A3.12.2.2.1. *For takeoff mishaps*, look for those who might have had good vantage points to see the aircraft from the time it was parked/being serviced to the time it came to rest. These might include:

A3.12.2.2.1.1. Crew Chiefs.

A3.12.2.2.1.2. Wingmen.

A3.12.2.2.1.3. Runway Supervisors.

A3.12.2.2.1.4. Air Traffic Controllers in the tower cab.

A3.12.2.2.1.5. Other flight line personnel, especially base operations and crash/fire/rescue crews.

A3.12.2.2.1.6. Passers-by, both on and off base, who were near the departure end of the runway.

A3.12.2.2.2. *For landing mishaps*, look for those who were in a good position to observe the aircraft from the time it entered the airfield environment until it came to rest. In addition to the above, this might include:

A3.12.2.2.2.1. Other aircraft in the pattern, especially those sequenced behind the mishap aircraft.

A3.12.2.2.2.2. Barrier maintenance personnel.

A3.12.2.2.3. *For mishaps away from the airfield*, the search for witnesses can be more complicated. The general area to be canvassed for witnesses can be either roughly circular (centered on the impact point), oblong (for an aircraft that was in distress for a period of time before crashing), or “dumbbell-shaped” (when a significant, identifiable aircraft component is found at a distance from the impact point).

A3.12.2.2.4. Generally, the level of effort to be expended in the initial search for witnesses should be proportional to the availability and quality of other types of evidence. Surviving crewmembers and a fairly intact aircraft generally can provide most of the answers needed by the permanent SIB, while a destroyed aircraft, with or without survivors, means less physical evidence and a corresponding need for more testimonial evidence.

A3.12.2.3. **Photographic Priorities.** The ISB IO should direct the activities of photographers at the mishap scene, bearing in mind that the medical member has priority for photographic support until all fatalities have been recovered or satisfactorily documented. After the medical member has no further immediate need for the photographer, the ISB IO supervises photography for all other ISB members.

A3.12.2.3.1. The following is a good, all-purpose list of photographs that should definitely be taken as soon as possible (in addition to the immediate requirements laid out in **paragraph A3.11.2.1**):

A3.12.2.3.1.1. The overall scene, shot from at least four different locations at ground level (include positions of bodies where possible), preferably with reference markers of some type in place (advise civil engineering surveyors if specific cultural features are used to reference pictures, e.g. road signs, fences, silos, etc.).

A3.12.2.3.1.2. Aerial (or at least elevated) photographs of the scene and all signs of initial impact (cuts in foliage, severed power lines, etc.).

A3.12.2.3.1.3. All fatalities and human remains in the wreckage prior to removal (if not previously accomplished).

A3.12.2.3.1.4. Life support equipment (ejection seat, parachute, survival vest/kit, oxygen mask, helmet, etc.).

A3.12.2.3.1.5. All impact marks on the ground, trees, buildings, poles, etc.

A3.12.2.3.1.6. Cockpit switch positions and instrument indications.

A3.12.2.3.1.7. Position and condition of all control surfaces, hydraulic actuators, emergency exits, panels, and cowlings.

A3.12.2.3.1.8. Significant parts of the wreckage, both at and separated from the site as appropriate (engines, landing gear, large pieces of wreckage, etc.).

A3.12.2.3.2. Once initial photography is completed, request production of two sets of contact (proof) sheets of all photographs taken; have them delivered directly to the SIB workcenter. If photographs were taken digitally, it may be necessary to have one or more primary SIB members go to the photo lab to review and select pictures for printing directly from the computer screen. It is important to emphasize that the digital images must be controlled like those produced on film. It is all too easy to start e-mailing photos and they often end up in the public domain before long. If human remains have been photographed, ensure proofs are marked accordingly, sealed in an envelope, and delivered directly to the interim medical member if possible.

A3.12.3. SIB Arrival Phase. The ISB safety officer should assist the ISB president in preparing a “handoff briefing” as described in **paragraph A3.11.3**. In addition, the ISB safety officer should:

A3.12.3.1. Have all pictures printed on contact sheets ASAP. If the pictures are digital, a contact sheet is still useful, particularly if computer support is slow or image manipulation software is not immediately available. Do not waste resources having enlargements made of any pictures other than general overviews (preferably aerial) of the site itself.

A3.12.3.2. List all DRF activities observed which may have changed the condition of wreckage or the position of fatalities. However, do not pass judgment on these actions -- the OSC determines the necessity of all activities at the site, and the permanent SIB will be in a far better position to determine whether any post-crash responses hampered their inquiry.

A3.12.3.3. Collect and lock up all interview tapes and written statements taken from witnesses. Immediately begin transcribing initial interviews with key mishap participants or witnesses; the permanent SIB will review them all and transcribe those that they wish to include in the formal report.

A3.13. Interim Pilot Member.

A3.13.1. The interim pilot member's charter is to assemble all crewmember and mission-related documentation associated with the mishap. Interim pilot members are not required to be current and qualified in the mishap aircraft the way permanent SIB pilot members are, although such expertise is valuable in assessing the kinds of records that may be available and germane to the investigation. However, if the mishap aircraft and/or crew are assigned to the installation assembling the ISB, the interim pilot member generally should not be selected from the same unit as the mishap crew and aircraft unless there are no other qualified individuals available. In such cases, especially in cases of fatal or extremely destructive mishaps, the interim pilot member should spend as little time as possible at the crash scene itself, confining his/her efforts to the assembly of relevant records. If the aircraft and crew involved are transient, select an interim pilot member from the “best fit” with the resource involved; for example, in the case of an F-16 mishap, the order of preference in selecting an interim pilot member from among trained candidates should be:

A3.13.1.1. An F-16 pilot

A3.13.1.2. A fighter pilot

A3.13.1.3. Any pilot

A3.13.2. Preparation Phase. Persons identified as potential ISB pilot members should ensure they are familiar with the location of all records described in the following paragraph.

A3.13.3. Notification/ISB Phase. The interim pilot member should seek to assemble (or direct impoundment of) all of the following records as soon as possible:

A3.13.3.1. Flight plan (DD Form 175, **Military Flight Plan**, DD Form 1801, **DOD International Flight Plan**, computer-generated flight plan, or local flight release as appropriate), DD Form 175-1, **Flight Weather Briefing**, DD Form 365-4, **Weight and Balance Clearance Form F**, flight orders, and other mission paperwork as appropriate.

A3.13.3.2. Line-up cards.

A3.13.3.3. Mission briefing guide.

A3.13.3.4. Passenger and cargo manifests and related documents.

A3.13.3.5. Flight Crew Information File (FCIF)/Flight Crew Bulletin (FCB) list and cards for all mishap crewmembers (including other members of mishap flight as appropriate).

A3.13.3.6. Crew records (Individual Aircrew Records and Flight Evaluation Folders for all mishap crewmembers (including other members of mishap flight as appropriate).

A3.13.3.7. Base operations, command post, and aircrew logs and voice and videotapes (including heads-up display [HUD] and ramp surveillance video and cockpit voice recorders [CVR] as appropriate).

A3.13.3.8. Local weather information, to include and observation and forecast closest to time of mishap and any special weather observations.

A3.13.3.9. Tower and radar approach control (RAPCON) tapes (mark and hold for review).

A3.13.3.10. Status of navigation aids and other enroute and terminal area air traffic control equipment.

A3.13.3.11. Current Notices to Airmen (NOTAM) in effect at the mishap airfield.

A3.13.3.12. One complete set of operations technical orders (Dash-1, checklists, air refueling manuals, etc.) specific to the mishap aircraft.

A3.13.3.13. Any of the following, if available/appropriate:

A3.13.3.13.1. AWACS tapes.

A3.13.3.13.2. Air Route Traffic Control Center (ARTCC) tapes.

A3.13.3.13.3. GCI-range tapes and records.

A3.13.3.13.4. Global aeronautical station tapes.

A3.13.3.13.5. Departure base tower and departure control tapes.

A3.13.3.13.6. Naval vessel radar tapes from the mishap area

A3.13.3.13.7. During flight test missions there is often additional data (autotheodolite, etc.)

A3.13.3.14. Any other records related to the mission.

A3.13.4. SIB Arrival Phase. The interim pilot member ensures all records and factual data described above are presented to his/her counterpart on the permanent board. If any of this information is not available, be prepared to explain its location and disposition (destroyed in the mishap, being held at another installation, etc.).

A3.14. Interim Maintenance Member. Like the interim pilot member, the interim maintenance member need not have experience with the specific weapon system involved in the mishap, although such familiarity is helpful.

A3.14.1. Preparation Phase. Persons identified as potential ISB maintenance members should ensure they are familiar with the location of all records described in **paragraph A3.14.2.**

A3.14.2. Notification/ISB Phase. The interim maintenance member should seek to assemble (or direct impoundment of) all of the following records as soon as possible:

A3.14.2.1. All AFTO Form 781 series documentation associated with the mishap aircraft, including engine records.

A3.14.2.2. TCTO status of the mishap aircraft.

A3.14.2.3. Automated maintenance records.

A3.14.2.4. Technician qualification training records (skill level certification, special certifications, marshalling training, etc.).

A3.14.2.5. One complete set of maintenance technical orders (refer to T.O. 00-5 series), work cards, servicing checklists, etc. specific to the mishap aircraft.

A3.14.2.6. Samples of fuel, oil, hydraulic fluid, gaseous or liquid oxygen samples, etc., used by mishap aircraft for contamination check (take samples from fuel truck, cart, oil stocks, etc., used to service mishap aircraft or vehicle).

A3.14.2.7. All AGE and vehicles used to service the mishap aircraft (fuel, oxygen, etc.) must be impounded as soon as possible. If mission requirements dictate their early return to operational status, the interim maintenance member is responsible for ensuring they are fully inspected and all discrepancies noted in appropriate technical data. AGE or vehicles found to have significant deficiencies that would normally result in their removal from service will be physically impounded and not examined further until after the permanent SIB has arrived. The interim maintenance member ensures all reports are filed on all such pieces of equipment as appropriate, and provides a copy to his/her permanent SIB counterpart immediately upon their arrival.

A3.14.3. SIB Arrival Phase. The interim maintenance member ensures all records and factual data described above are presented to his/her counterpart on the SIB. If any of this information is not available, be prepared to explain its location and disposition (destroyed in the mishap, being held at another installation, etc.).

A3.15. Interim Medical Member (Flight Surgeon).

A3.15.1. Like the ISB safety officer, the interim medical member is responsible for capturing a significant amount of highly perishable evidence. However, an interim medical member's first responsibility at any mishap scene is as a physician, caring for the injured. The flight surgeon has two main responsibilities: to ensure survivors receive appropriate and expeditious healthcare, and to preserve

medical evidence. For mishaps involving more than one aircrew member, where there may be fatalities and survivors brought to different medical treatment facilities, ISB flight surgeons must prioritize where their presence will have the greatest benefit. In such cases, participation by several flight surgeons may be essential. Request assistance from the ISB president and MDG/CC, if necessary. Once the injured have been treated and removed from the scene, the interim medical member plays a critical role in three areas:

A3.15.1.1. Gathering forensic evidence through photography and personal observation.

A3.15.1.2. Facilitating access of Armed Forces Institute of Pathology medical examiners to the dead and injured.

A3.15.1.3. Participating in autopsies of occupants of the aircraft if the permanent SIB's medical member is unable to be in place prior to their start.

A3.15.2. Preparation Phase:

A3.15.2.1. Work with JA and MDG/CC to ensure jurisdiction of human remains located both on or off-base is clarified with respect to local coroners/medical examiners. Develop a working relationship with local coroners/medical examiners, educate them on USAF mishap forensic medical investigation requirements, and work out expeditious forensic autopsy procedures; encourage them to permit maximum involvement by AFIP.

A3.15.2.2. Schedule, plan and execute routine in-house mishap response exercises with all flight surgeons and aerospace medicine technicians participating. Also incorporate participation by bioenvironmental engineering, radiology and laboratory personnel.

A3.15.2.3. Consider exercising with the local search and recovery/mortuary affairs team.

A3.15.2.4. Provide relevant training to IDMTs who may be tasked to provide medical care at remote mishap sites and emergency room personnel who may receive mishap casualties or be called to provide initial response to after-hours mishaps. Of particular importance is education on mishap site hazards. For installations which commonly see U-2s, familiarity with the full pressure suit is essential.

A3.15.2.5. Ensure man-portable mishap response kits are available, stocked, inventoried regularly and trained on.

A3.15.3. Notification/ISB Phase:

A3.15.3.1. Immediately upon notification:

A3.15.3.1.1. Note the time and location of the mishap.

A3.15.3.1.2. Identify aircraft type and souls on board (if known).

A3.15.3.1.3. Establish survivor status and location (if known) and ground casualties (if any).

A3.15.3.1.4. If any channel exists to pass information to the civil authorities involved, assert the need not to disturb human remains. If remains already have been moved, ask the cognizant agency not to remove or deal with clothing or personal items beyond basic identification, and to refrigerate rather than embalm remains.

A3.15.3.1.5. If available, record names of those involved, review and impound the medical and dental records; if assigned to another installation, contact their flight medicine clinic

immediately and request impoundment of the appropriate records. Determine whether mental health records, substance abuse records, or family advocacy records exist; have them sequestered if they do exist.

A3.15.3.1.6. Place a preliminary call to the AFIP if fatalities are confirmed or if injury pattern analysis may be required.

A3.15.3.1.7. Obtain transportation to the scene by the fastest means available. Beyond ambulance response range, you will need to identify either the helicopter departure or the convoy assembly point and report to it prepared to perform both survivor care and fatality investigation; bear in mind that you may be called upon to treat injuries sustained during and after the emergency response itself.

A3.15.3.2. Upon arrival at the scene:

A3.15.3.2.1. Report to the OSC; describe your team, medical resources available, and proposed location for evacuation of survivors.

A3.15.3.2.2. Perform triage, render care to the injured, and arrange for their prompt evacuation from the scene. Document their location and condition with photographs when possible and warranted.

A3.15.3.2.3. Release no information at the scene.

A3.15.3.2.4. If fatalities are present at the scene, determine if you need to accompany the injured to the treatment facility to continue their care; if you must, ensure other medical professionals are enroute before departing if at all possible, and ensure the local coroner has been notified. Determine jurisdiction over the human remains. Note: you cannot declare death or move remains if there is no Federal jurisdiction over remains at the mishap site.

A3.15.3.2.5. Determine extent of mishap site environmental hazards from the bioenvironmental engineer and recommended personal protective equipment.

A3.15.3.2.6. If no survivors require treatment, refer to **paragraph A3.15.2.4.** for initial investigative actions.

A3.15.3.3. At the medical treatment facility:

A3.15.3.3.1. Draw specimens for laboratory and toxicological analysis as soon as possible after the mishap (may be drawn *in situ* if recovery of casualties is likely to be delayed, but should be accomplished at a medical facility if practical). Discuss with ISB president and ISB IO whether any maintenance personnel, air traffic controllers, etc, should provide toxicological samples as well. Remember, these data are perishable and cannot be gotten later. If survivors have been brought to a civilian medical facility, ensure to the best of your ability that strict chain of custody over these specimens is maintained and documented. If the survivors have received any medication prior to the samples being drawn, ensure they are documented.

A3.15.3.3.2. Perform complete physical examinations and develop a 72-hour history and 14 day history on all surviving aircrew members, or see that another flight surgeon does so; if they are not to remain as in-patients, release them from the treatment facility only after these steps have been completed. Be sure to make note of any medical waivers, medications, herbal preparations, nutritional supplements or other alternative medicine modalities used. Make the

appropriate aeromedical dispositions. Remember, the flight surgeon's history and physical exam have priority over any other interviews.

A3.15.3.3.3. For fatalities, data necessary to complete the 72 hour and 14 day histories must be reconstructed from family, friends, co-workers etc. Ideally, this should be done within 24-48 hours to ensure accuracy.

A3.15.3.3.4. Perform radiological studies as indicated. After all ejections, bailouts, and crashes, full spinal radiographs are required.

A3.15.3.3.5. Keep the surviving aircrew separate until after initial interviews are conducted.

A3.15.3.3.6. Accomplish physical examinations of other non-aircrew survivors who were aboard. Correlate all survivors and the injuries they suffered with their seating arrangements.

A3.15.3.3.7. Ensure mental health personnel are coordinating with the chaplains to provide CISM for all responding personnel.

A3.15.3.3.8. If autopsies are to be performed prior to the arrival of the SIB flight surgeon, be certain to be in attendance. Ensure finger and footprints are taken (if available), and dental and DNA identification is performed.

A3.15.3.4. Initial Medical Investigation of Casualties.

A3.15.3.4.1. Medical investigation of fatalities at a mishap scene is essential to the preservation of forensic evidence, which is the most perishable of all physical evidence. It is primarily a medical function, but will require close cooperation with at least four other members of the DRF:

A3.15.3.4.1.1. ISB safety officer (safety representative to the DRF).

A3.15.3.4.1.2. Mortuary Affairs search and recovery team leader.

A3.15.3.4.1.3. Civil Engineering representative responsible for surveying the scene.

A3.15.3.4.1.4. Photographer.

A3.15.3.4.2. Have the OSC assemble these individuals and lay out a preliminary strategy for approaching each fatality in turn. Explain the objectives of this phase of your investigation, namely:

A3.15.3.4.2.1. Identification of each individual.

A3.15.3.4.2.2. Placement of each individual in their proper location, both with respect to the wreckage and at the scene itself.

A3.15.3.4.2.3. Association of specific injuries with specific aircraft structures.

A3.15.3.4.3. Advise all parties as to the hazards posed by possible blood borne pathogens and hazardous aerospace materials in the area. Also, make it clear to the ISB IO that, if photographic resources are limited, you must now have control of at least one dedicated photographer until all recovery actions are complete. Pencil flares, other pyrotechnics, and ammunition may be found in personal gear and on human remains; they become unstable after exposure to fire.

WARNING: Ensure EOD has cleared the area. If ejection seats are present, ensure they have been safed or pinned before approaching them.

A3.15.3.4.4. Proceed with the on-scene investigation as follows:

A3.15.3.4.4.1. Ensure each fatality has been staked and extensively photographed before beginning your examination.

A3.15.3.4.4.2. Photograph and examine life-support equipment attached to or lying with remains before moving them.

A3.15.3.4.4.3. Do not remove personal equipment from the body before radiographs are taken or before the autopsy.

A3.15.3.4.4.4. Record each fatality's position in the aircraft, personal equipment present. Look for specific identification points such as scars, body marks, hair and personal effects without disturbing the body too greatly; you are doing this to assist with initial identification but this review and formal identification are most appropriately performed at autopsy.

A3.15.3.4.4.5. Body fluids from fatalities should generally not be collected at the mishap site. The autopsy is the proper place for the collection of necessary specimens.

A3.15.3.4.4.6. Look for blood or tissue transfers to aircraft structures that may later prove a critical point. Do not tamper with fractured metal surfaces, as this may destroy clues.

A3.15.3.4.4.7. Ensure the site diagram includes body position, clothing, and life-support equipment with relative positions and relation to aircraft; for large-frame aircraft, ensure the location of each fatality with respect to emergency exits is depicted as well.

A3.15.3.4.4.8. Stake out and label places where life support gear, and personal items were recovered.

A3.15.3.4.4.9. Ensure partial human remains are staked and photographed before allowing them to be moved; label all such remains with DD Form 1380, **Field Medical Card** by location stake.

A3.15.3.4.4.10. Release the photographer to other board members only after all available remains have been photographed at the mishap site.

A3.15.3.4.4.11. If time of death is a concern (for example, when a casualty is found after a prolonged search or in a survival situation), request consultant assistance as soon as practical.

A3.15.4. SIB Arrival Phase:

A3.15.4.1. Prepare a synopsis of response and treatment actions taken to date, including care plans in place for in-patients.

A3.15.4.2. Consult with AFIP members as to their proposed autopsy schedule; attend the post mortem if the permanent SIB medical member cannot be in place in time, and arrange an outbrief for the entire permanent SIB with the lead medical examiner.

A3.15.4.3. Ensure you are in continuous contact with mortuary affairs and that they keep you aware of the status of next-of-kin notification and the search and recovery of additional remains (if applicable).

A3.15.4.4. Ensure all medical photography is secured and readied for presentation to the permanent SIB medical member, along with the medical and dental charts, a listing of any sequestered mental health, family advocacy or substance abuse records, results of all post-mishap physical examinations, 72-hour and 14 day histories, and laboratory tests.

A3.15.4.5. Interim medical members may also be called upon to serve as members of the SIB when convened, and should be prepared for this eventuality. If the interim medical member is associated with the mishap unit, however, assignment to the SIB should be highly discouraged.

A3.16. Interim Recorder (optional). At MAJCOM option, units may wish to train one or more recorders as a part of their interim board cadre. Recorders are customarily drawn from the installation experiencing the mishap (or supporting the mishap investigation), so interim board recorders, if appointed, could be of significant help in bridging the gap between the ISB and SIB. If interim recorders are not predesignated, wing/group safety staffs ensure the following steps are taken as a part of their pre-mishap and mishap response planning.

A3.16.1. Preparation Phase. The interim recorder's principle role is to help installations get an early start in preparing for the arrival of the SIB. Therefore, he or she must be familiar with all aspects of the base Mishap Response Plan with respect to:

A3.16.1.1. The designated workcenter, including computer, furniture, and office equipment availability.

A3.16.1.2. Prearranged communications (dedicated phone lines for workcenter, availability of walkie-talkies, cellular phones, pagers, etc. for board use).

A3.16.1.3. Local and long-haul transportation available (organic and contract).

A3.16.1.4. Contingency billeting arrangements (for 10-15 people minimum).

A3.16.1.5. Temporary supply accounts (for personal equipment, administrative supplies, etc.).

A3.16.1.6. As a part of pre-mishap planning, the interim recorder should also assemble a telephone list for quick reference by ISB and SIB members. Include the following:

A3.16.1.6.1. Wing:

A3.16.1.6.1.1. Commander.

A3.16.1.6.1.2. Safety office.

A3.16.1.6.1.3. Staff Judge Advocate.

A3.16.1.6.2. Operations Group:

A3.16.1.6.2.1. Commander.

A3.16.1.6.2.2. Command post.

A3.16.1.6.2.3. Flight records section (flying time data).

A3.16.1.6.2.4. Nearest helicopter unit (organic or otherwise).

- A3.16.1.6.2.5. Operations training.
- A3.16.1.6.2.6. Supervisor of Flying.
- A3.16.1.6.3. Operational Squadrons:
 - A3.16.1.6.3.1. Commanders.
 - A3.16.1.6.3.2. Operations Officers.
 - A3.16.1.6.3.3. Duty officers.
- A3.16.1.6.4. Operations Support Squadron:
 - A3.16.1.6.4.1. Commander
 - A3.16.1.6.4.2. Airfield manager.
 - A3.16.1.6.4.3. Approach control.
 - A3.16.1.6.4.4. Base operations dispatch.
 - A3.16.1.6.4.5. Chief of Air Traffic Control Operations/Facility Manager.
 - A3.16.1.6.4.6. Control tower.
 - A3.16.1.6.4.7. FAA liaison.
 - A3.16.1.6.4.8. Weather.
- A3.16.1.6.5. Logistics Group:
 - A3.16.1.6.5.1. Commander.
 - A3.16.1.6.5.2. Crash recovery team.
 - A3.16.1.6.5.3. Airlift coordination center/validator.
 - A3.16.1.6.5.4. Quality Assurance.
 - A3.16.1.6.5.5. Maintenance Control
 - A3.16.1.6.5.6. Maintenance squadrons.
 - A3.16.1.6.5.7. Technical engineering.
 - A3.16.1.6.5.8. Servicing shops, as required.
- A3.16.1.6.6. Support organizations:
 - A3.16.1.6.6.1. Aero club.
 - A3.16.1.6.6.2. Base administration.
 - A3.16.1.6.6.3. Installation reproduction.
 - A3.16.1.6.6.4. Billeting.
 - A3.16.1.6.6.5. Communications squadron.
 - A3.16.1.6.6.6. EOD.
 - A3.16.1.6.6.7. Fire department.

A3.16.1.6.6.8. Graphics.

A3.16.1.6.6.9. Public affairs office.

A3.16.1.6.6.10. In-flight kitchen.

A3.16.1.6.6.11. Life support.

A3.16.1.6.6.12. Mortuary Affairs.

A3.16.1.6.6.13. Motor pool.

A3.16.1.6.6.14. Personnel Flight (personal affairs, orders section).

A3.16.1.6.6.15. Photo lab.

A3.16.1.6.6.16. Readiness Flight.

A3.16.1.6.6.17. Reclamation, wreckage, and storage.

A3.16.1.6.6.18. Security forces.

A3.16.1.6.7. Medical Group:

A3.16.1.6.7.1. Emergency room.

A3.16.1.6.7.2. Bioenvironmental engineering.

A3.16.1.6.7.3. Flight medicine.

A3.16.1.6.7.4. Radiology.

A3.16.1.6.7.5. Laboratory.

A3.16.1.6.8. Other tenant units (as appropriate).

A3.16.1.6.9. Off-Base agencies:

A3.16.1.6.9.1. City and county police.

A3.16.1.6.9.2. Emergency Services/Civil Defense coordinator.

A3.16.1.6.9.3. Local hospitals and ambulance services.

A3.16.1.6.9.4. Coroner or medical examiner.

A3.16.1.6.10. National Guard:

A3.16.1.6.10.1. State Adjutant General's office.

A3.16.1.6.10.2. Local National Guard armory/Air National Guard facility.

A3.16.1.6.11. MAJCOM, NAF, and supporting safety offices.

A3.16.1.6.12. HQ AFSC directorates (SEF, SEG, SEP, and SEW), Kirtland AFB NM.

A3.16.2. Notification/ISB Phase:

A3.16.2.1. Report to designated workcenter.

A3.16.2.2. Accept and control all impounded records from:

A3.16.2.2.1. Operations.

A3.16.2.2.2. Maintenance.

A3.16.2.2.3. Fuels/Supply.

A3.16.2.2.4. Operations center (command post).

A3.16.2.2.5. Base operations.

A3.16.2.2.6. Air traffic control (certified extracts of tower tapes).

A3.16.3. SIB Arrival Phase. Be prepared to lend all possible assistance in orienting newly arrived permanent SIB members to installation facilities and workcenter provisions. Begin arrangements for supplementary administrative assistance for interview tape transcription, which should commence as soon as possible so that ISB interviews are transcribed by the time the SIB members have arrived.

Attachment 4

SAFETY INVESTIGATION BOARD CHECKLISTS

Section A4A—Using This Attachment

A4.1. Introduction. The checklists in this attachment is designed to help permanent safety investigation members capture information that may be relevant to their investigation. It is organized in such a manner that ISB members may start filling in information immediately, then pass the partially completed worksheets to their permanent board counterparts upon arrival. The board president does not have a checklist.

A4.2. Purpose. This attachment is intended to give individual participants on the SIB a place to start in the tasks they are expected to accomplish. Each board member should become familiar with and answer all sections of their checklist. The board president should be familiar with all duties of the board members.

Section A4B—Permanent Safety Investigation Board Member Checklists

A4.3. Investigating Officer Checklist and Questions:

A4.3.1. Introduction. The following is a basic list of areas which must be addressed in the course of an investigation. Topic areas such as the sequence of events, personal background and training, supervisory issues, communication problems, peer influences, and access to adequate facilities and services should be investigated and reviewed with the flight surgeon. As you consider each of these areas in turn, keep the following guidelines in mind:

A4.3.1.1. Supervisory issues may include such problems as discipline enforcement, command and control, supervisory role model behavior, and over-tasking.

A4.3.1.2. Communication problems could involve those within the cockpit, outside the cockpit, between personalities, and equipment failure.

A4.3.1.3. Peer influences may be discerned through verbal comments, commonly held beliefs based on unspoken or unwritten learning, and perceptions of equipment concerns.

A4.3.1.4. Adequacy of quarters, adequate nutrition, exercise, recreation and health care must be examined with as much care as airfield facilities or air traffic control services for their effect on human performance at the time of the mishap.

A4.3.2. Many of the areas listed in this checklist overlap with those of other members. This is deliberate, since the investigating officer who, except for the Air Force Safety Center representative, is usually the most comprehensively trained member of a given board when it comes to analyzing mishap factors. Investigating officers should review the areas considered by other board members in the checklists that follow this one.

A4.3.3. Airfield Facilities. For the following, describe any problems that increased workload or stress, or otherwise hindered the pilot:

A4.3.3.1. Runway environment:

A4.3.3.2. Approach environment:

A4.3.3.3. Radar facilities:

A4.3.3.4. Weather assessment equipment:

A4.3.3.5. Maintenance equipment:

A4.3.3.6. Airfield equipment:

A4.3.3.7. Navigation aids:

A4.3.3.8. Flight planning facilities:

A4.3.3.9. Crew rest facilities:

A4.3.3.10. Dining facilities/In-flight meals:

A4.3.3.11. Transient maintenance:

A4.3.3.12. Ground transportation:

A4.3.3.13. Emergency equipment:

A4.3.3.14. Training equipment:

A4.3.3.15. Training facilities:

A4.3.3.16. Alert facilities:

A4.3.3.17. Other (specify):

A4.3.4. Support Agencies. For the following agents or categories of support agencies, name and comment on how each contributed to or sustained mishap sequence of events:

A4.3.4.1. Other crew or flight members:

A4.3.4.2. Maintenance personnel:

A4.3.4.3. Weather services (to include wind shear reporting):

A4.3.4.4. Air route traffic control:

A4.3.4.5. Approach and departure control:

A4.3.4.6. Tower and ground control:

A4.3.4.7. Command post:

A4.3.4.8. Supervisor of flying:

A4.3.4.9. Runway Supervisory Unit:

A4.3.4.10. Airfield maintenance:

A4.3.4.11. GCI site:

A4.3.4.12. Range officer and control:

A4.3.4.13. Medical support:

A4.3.4.14. Supply:

A4.3.4.15. Another aircraft:

A4.3.4.16. Other (explain):

A4.3.5. Job Performance Aids. For the following categories of job performance aids, name the specific item involved for each and describe any problems of completeness, clarity, availability, and currency as they relate to the mishap flight:

A4.3.5.1. Technical orders:

A4.3.5.2. Checklists and Flight Information Publications (FLIP):

A4.3.5.3. US Air Force instructions, manuals, and pamphlets:

A4.3.5.4. MAJCOM instructions, manuals, and pamphlets:

A4.3.5.5. Subordinate command instructions, manuals, and pamphlets:

A4.3.5.6. Aircraft operating instructions:

A4.3.5.7. Other operating instructions:

A4.3.5.8. FCIF/FCB:

A4.3.5.9. Standard instrument departure (SID) plates:

A4.3.5.10. Approach plates:

A4.3.5.11. Charts and maps:

A4.3.5.12. Rules of engagement (ROE):

A4.3.6. Communication and CRM Problems:

A4.3.6.1. Were there any reported or perceived conflicts between the pilot and other crew or flight members related to the mishap flight? If yes, explain:

A4.3.6.2. What characterized the usual attitude of the pilot toward other crew members/other members of the flight?

A4.3.6.3. Did the attitude of the pilot toward other crew members or members of the flight influence their behavior during the mishap flight? If yes, how?

A4.3.6.4. Did the pilot appear to have effectively used other crew or flight members during the mishap flight? If not, what deficiencies or omissions were observed?

A4.3.6.5. Describe any problems in communication or cockpit/crew resource management between the pilot and other crewmembers, or the pilot and outside agencies:

A4.3.6.6. Describe any abnormalities in crew and flight coordination as they relate to the mishap sequence of events:

A4.3.6.7. Did the pilot, any crewmember, or outside agency exhibit "copilot syndrome"? If yes, name and explain:

A4.3.6.8. Was there a failure in communication equipment? If yes, describe:

A4.3.6.9. Were there any difficulties with air-to ground communication during the mishap flight? If yes, describe:

A4.3.7. Crew Rule Conformance, Violations, and Waivers:

A4.3.7.1. Was the pilot prone to bend the rules? If yes, what would be his or her rationale? (Motivation?)

A4.3.7.2. Were there any known violations of rules, OIs, instructions or established procedures in the past? If yes, explain:

A4.3.7.3. Were there any violations of rules, OIs, instructions or established procedures on this mishap? If yes, explain; include rationale if known:

A4.3.7.4. Did the pilot or others violate any rules? If yes, what was the rationale for those violations?

A4.3.7.5. Was the supervision in the unit consistent with the mission, organization, and equipment assigned? If no, explain:

A4.3.7.6. Was the example set by supervisors supportive of both established rules and disciplined behavior? If no, explain:

A4.3.7.7. Did other unit members perceive that rules were frequently violated? If warranted, use the sample survey at [Attachment 7](#) as a guide to gather more information:

A4.3.7.8. For the following types of rules, name and explain any waivers and the source of their authorization:

A4.3.7.8.1. Operational rules:

A4.3.7.8.2. Training rules:

A4.3.7.8.3. Maintenance rules:

A4.3.7.8.4. Other rules:

A4.3.8. Operating Area:

A4.3.8.1. Describe the mishap mission operating area:

A4.3.8.2. Was the pilot familiar with the operating area? If no, explain:

A4.3.8.3. Was the pilot on a deployment? If yes, describe the deployment purpose and situation:

A4.3.8.4. If deployed, how long had it been since departing home base and how long before the planned return?

A4.3.8.5. Enter any other data relating to the pilot's environment not covered above which you consider necessary to fully describe their contribution to or involvement in the mishap event sequence:

A4.3.9. Supervisor Assessment. How did the pilot's supervisors rate him or her as a pilot?

A4.3.10. Unit Morale. Comment on the level of unit morale; if warranted, use the sample survey at [Attachment 7](#) as a guide to gather more information:

A4.3.11. Personal Motivation:

A4.3.11.1. Why did the pilot want to fly?

A4.3.11.2. What was likely his or her attitude toward this flight?

A4.3.12. Personal Satisfaction: Indicate the pilot's level of satisfaction in the following areas by circling the appropriate number where 1 is *Extremely Satisfied*, 4 would indicate Neutral and 7 is *Extremely Dissatisfied*.

Career choice	1	2	3	4	5	6	7
Duty location	1	2	3	4	5	6	7
Aircraft assignment	1	2	3	4	5	6	7
Additional duties	1	2	3	4	5	6	7

A4.3.13. Decision Responsibility:

A4.3.13.1. Was the person responsible for making decisions relevant to the mishap flight clearly defined and accessible? If no explain:

A4.3.13.2. Was the person responsible for making decisions the same as the person with the authority to make decisions? If no, explain:

A4.3.14. Supervisory Activity and Control:

A4.3.14.1. Who was the supervisor most directly associated with the conduct of the mishap mission?

A4.3.14.2. Was the supervisor qualified according to current instruction?

A4.3.14.3. Was supervisory guidance a factor in the mishap sequence of events? If yes, explain:

A4.3.14.4. What was the quality of first level of supervision?

A4.3.14.5. What command, leadership, or management training did the supervisor have?

A4.3.14.6. Did this training (or lack of) impact the aircrew environment? If yes, explain:

A4.3.15. Other Possible Factors:

A4.3.15.1. Selection policy:

A4.3.15.2. Promotion evaluation policy:

A4.3.15.3. Additional duties:

A4.3.15.4. Adaptation to military lifestyle:

A4.3.15.5. Identification with the US Air Force's mission:

A4.3.15.6. Other (explain):

A4.4. Pilot Member Checklist and Questions:

A4.4.1. Introduction. You have been selected to serve on this board based on your expertise in the mishap aircraft. You are expected to objectively assess the performance of both the human and the machine throughout the mishap mission. The questions that follow are designed to help you assemble data and develop a strategy for pursuing the "operational" portion of the investigation. Your principle areas of interest include:

A4.4.1.1. Qualifications, proficiency, and training of the aircrew.

A4.4.1.2. Mission-specific concerns (what, where, how, and why it was performed as it was).

A4.4.1.3. Communications within, outside, and between aircraft.

A4.4.1.4. Performance of the aircraft throughout the mishap sequence.

A4.4.1.5. Aircrew actions throughout the mishap sequence.

A4.4.1.6. Special stresses (time of day, weather, emergency, etc.).

A4.4.1.7. Aircraft-related problems which could affect aircrew performance (design, cockpit layout, etc.).

A4.4.2. Common Challenges for the Pilot Member. There are two types of mishaps where your task is particularly difficult: a mishap with no survivors and a mishap that, on the surface, appears to be due to a straightforward mechanical problem. In the former case, you must rely entirely on your own experience in the mishap aircraft to help the rest of the board understand what might have happened, or to assess the actions of dead colleagues. In the latter, it can sometimes be difficult to step back and consider how the aircrew might have made their situation better (or worse) prior to or following the mechanical failure, or if their actions themselves somehow triggered the “mechanical” problem. Keep an open mind, and keep as much emotional distance from the mishap sequence as possible. Remember: a safety investigation is designed to prevent recurrence, and you are crucial to the success of that mission.

A4.4.3. Checklist Technique. Make copies of the checklist. On one, take down all information you are able to develop from totally factual sources (ATC tapes, flight data recorder information, wreckage analysis, flight planning materials, etc.). Then, take a clean, blank checklist to each interview of a participant in the mishap sequence. Once they have been given the opportunity to “tell their story” (see [Chapter 7](#) and [Attachment 5](#)), use the checklist as a guide for further information gathering. Following the interview, make sure you can account for and resolve any discrepancies between the witness’ recollection and the information you obtained from factual sources.

A4.4.4. Flying Experience (Each Aircrew Participant):

A4.4.4.1. Total rated flying hours:

A4.4.4.2. Total civilian flying hours:

A4.4.4.3. Total non-pilot hours (Navigator, Weapon System Operator, etc.):

A4.4.4.4. Total mission hours:

A4.4.4.5. Total student pilot hours:

A4.4.4.6. Total MP and IP hours:

A4.4.4.7. Total hours in mishap-type aircraft:

A4.4.4.8. FP and IP hours in all aircraft and mishap-type aircraft for the following time periods:

Table A4.1. Flying Time

AIRCRAFT:			
Total			
30 days			
60 days			
90 days			

A4.4.4.9. Recent Flying Hours and Sorties (Night and IMC time if pertinent):

Table A4.2. 30/60/90 Time and Sorties

	TOTAL	NIGHT	IMC
Hours for the last 7 days			
Hours for the last 30 days			
Hours for the last 60 days			
Hours for the last 90 days			
Sorties flown in the last 7 days			
Sorties flown in the last 30 days			
Sorties flown in the last 60 days			
Sorties flown in the last 90 days			
Type and number of sorties planned in the last 7 days			
Type and number of sorties briefed in the last 7 days			
Type and number of sorties flown in the last 7 days			

A4.4.5. Multiple Qualifications. Other than mishap aircraft, type of other aircraft (civilian or military) the pilot was current in at time of mishap:

A4.4.5.1. Were there differences in cockpit layout between the mishap aircraft and other models or other aircraft with modifications that the operator flew? If yes, explain:

A4.4.5.2. Were there significant aerodynamic differences between the mishap aircraft and other models or other modified versions of the aircraft that the pilot flew? If yes, describe:

A4.4.6. What was the pilot's current phase of training (Specialized Undergraduate Pilot Training (SUPT), upgrade, continuation, etc.)?

A4.4.6.1. Were there any problems in previous or current phase of training related to the mishap flight? If yes, explain:

A4.4.6.2. Describe any recent time lags between training and operational assignment:

A4.4.6.3. What is the quality or state of wing or squadron training in the area pertaining to the mishap?

A4.4.7. SUPT History Data (SUPT Students Only):

A4.4.7.1. How many instructors did the pilot have?

A4.4.7.2. How many other students did the pilot share with his or her instructor?

A4.4.7.3. How many rides were graded less than satisfactory?

A4.4.7.4. Where was the pilot ranked in his or her class?

A4.4.8. Mission Planning:

A4.4.8.1. How long did mission planning take?

A4.4.8.2. Explain any unusual aspects of mission planning:

A4.4.8.3. Did all relevant persons participate in mission planning? If no, explain:

A4.4.8.4. Evaluate and comment on the mission planning as follows:

A4.4.8.4.1. Completeness:

A4.4.8.4.2. Adequacy:

A4.4.8.4.3. Adherence to MAJCOM/unit standards:

A4.4.9. Mission Briefing:

A4.4.9.1. How long did the mission briefing take?

A4.4.9.2. Were there any unusual aspects of the mission briefing? If yes, explain:

A4.4.9.3. Did all relevant persons participate in mission briefing? If no, explain:

A4.4.9.4. Evaluate and comment on the mission briefing as follows:

A4.4.9.4.1. Completeness:

A4.4.9.4.2. Adequacy:

A4.4.9.4.3. Adherence to MAJCOM/unit standards:

A4.4.10. Mission Type. What type of missions were planned/briefed?

A4.4.10.1. Primary:

A4.4.10.2. Secondary:

A4.4.10.3. Tertiary:

A4.4.10.4. Other:

A4.4.11. Sortie Characteristics. Was the mishap sortie perceived as a special sortie of some type? If yes, explain:

A4.4.11.1. Sortie type:

A4.4.11.2. Sortie urgency:

A4.4.12. Time Constraints. Was the pilot rushed or constrained by time in any way? If yes, explain:

A4.4.13. Readiness to Fly. Given stressors such as fatigue, external distraction, etc., was the pilot physically ready to fly at the beginning of the mishap sequence of events? If not, why?

A4.4.14. Phase of Flight. In what phase(s) of flight did the mishap occur?

A4.4.15. CRM:

A4.4.15.1. Were there any noticeable conflicts between the pilot and other crew or flight members before or during the mishap flight? If yes, explain:

A4.4.15.2. What characterized the usual attitude of the pilot toward other crewmembers?

A4.4.15.3. Did the attitude of the pilot toward other crew or flight members influence their behavior during the mishap flight? If yes, how?

A4.4.15.4. Did the pilot appear to effectively use other crew or flight members? If not, why?

A4.4.16. Operating Conditions (Meteorological/Environmental):

A4.4.16.1. Cloud cover (height and amount):

A4.4.16.2. Precipitation (type and amount):

A4.4.16.3. Icing (type and amount):

A4.4.16.4. Freezing level:

A4.4.16.5. Surface winds (direction, velocity, gusts):

A4.4.16.6. Winds aloft (direction and velocity):

A4.4.16.7. Ambient temperature (deg. F / deg. C):

A4.4.16.8. Pressure altitude:

A4.4.16.9. Visibility (distance and restrictions):

A4.4.16.10. Noise (type, level and source):

A4.4.16.11. Vibration (type, frequency, intensity, and source):

A4.4.16.12. Turbulence (type, intensity, and source):

A4.4.16.13. Natural illumination (sun angle, glare, etc.; include moon illumination and phase for night/NVD mishaps):

A4.4.16.14. Artificial illumination (cockpit lights, runway lights, etc.):

A4.4.16.15. Heavy weather phenomena:

A4.4.17. Configuration at Mishap. Indicate the relationship of the following components and their respective configurations to the mishap if applicable:

A4.4.17.1. Gear:

A4.4.17.2. Flaps:

A4.4.17.3. Spoilers or speed brakes:

A4.4.17.4. Trim (degrees):

A4.4.17.5. Engines:

A4.4.17.6. Fuel on board (pounds):

A4.4.17.7. Cargo on board (pounds):

A4.4.17.8. Passengers on board:

A4.4.17.9. Armament or ordnance on board (type/pounds):

A4.4.17.10. Center of gravity position:

A4.4.17.11. Other (specify):

A4.4.18. Mission/Maneuver Description:

A4.4.18.1. Mission type:

A4.4.18.2. Maneuver type:

A4.4.18.3. Crew's familiarity with type of mission and maneuver:

A4.4.18.3.1. Was the pilot current in the maneuver being attempted?

A4.4.18.3.2. How long ago, if ever, had it been since the pilot performed the maneuver which ended in the mishap?

A4.4.18.4. List any differences in the conditions or circumstances about the last time the maneuver was performed and the one that ended in mishap (e.g., day vs. night, cloudy vs. clear, solo vs. dual, different ordnance, different flight composition, etc.):

A4.4.18.5. Did anything occur on recent sorties (within 2 weeks) which may have influenced the pilot's behavior during the mishap sortie? If yes, explain:

A4.4.18.6. Did anything occur during other training (e.g., simulator, procedural, ground) which influenced the pilot's behavior during the mishap sortie? If yes, explain:

A4.4.18.7. What other factors related to experience may have made the mission or missions more difficult for the pilot? Explain:

A4.4.18.8. Mishap Task Intentions:

A4.4.18.8.1. Describe the mishap task:

A4.4.18.8.2. What was the pilot attempting to do?

A4.4.18.9. Mishap Duration:

A4.4.18.9.1. What was the planned duration of the mishap flight?

A4.4.18.9.2. What was the actual duration of the mishap flight?

A4.4.19. Tactics:

A4.4.19.1. What tactic was used or attempted?

A4.4.19.2. Was the tactic approved?

A4.4.19.3. Were the tactics used familiar to the pilot? If no, explain:

A4.4.20. Aircraft Attitude, Altitude and Airspeed During the Mishap Sequence:

A4.4.20.1. Describe the maneuver or attitude of the aircraft at the beginning of the mishap sequence of events:

A4.4.20.2. If at all possible, describe the aircraft attitude change onset rates during the mishap sequence of events in terms of the following:

A4.4.20.2.1. Pitch rate (degrees per second and extreme values):

A4.4.20.2.2. Roll rate (degrees per second and extreme values):

A4.4.20.2.3. Yaw rate (degrees per second and extreme values):

A4.4.20.2.4. Angle of attack rate (units per second and extreme values):

A4.4.20.3. Describe the influence of the above changes on aircrew actions:

A4.4.20.4. Altitude and Airspeed at Mishap:

A4.4.20.4.1. Indicate the altitude and airspeed of the aircraft at the beginning of the mishap sequence of events:

A4.4.20.4.2. Altitude (feet MSL):

A4.4.20.4.3. Altitude (feet AGL):

A4.4.20.4.4. Mach:

A4.4.20.4.5. Airspeed (KIAS):

A4.4.20.5. Describe the aircraft altitude and airspeed change rates during the mishap sequence of events:

A4.4.20.6. Describe the processes of aircraft altitude and airspeed change during the mishap sequence of events:

A4.4.20.7. Describe the flight path of the aircraft and any aircraft or flight envelope anomalies that occurred during the mishap event sequence:

A4.4.21. Acceleration Forces at Mishap:

A4.4.21.1. What were the acceleration forces on the pilot at the beginning of the mishap sequence of events?

A4.4.21.1.1. Onset rate (G per second if estimated):

A4.4.21.1.2. Direction:

A4.4.21.1.3. Magnitude (G if estimated):

A4.4.21.2. If pertinent, describe the acceleration force changes and change rates during the mishap sequence of events:

A4.4.21.3. Describe the processes which changed the acceleration forces during the mishap event sequence:

A4.4.21.4. Describe any consequences of "G" effect on control operation:

A4.4.22. Procedural Anomalies at Mishap:

A4.4.22.1. Name the operating procedure/maneuver being performed at the time of the mishap; explain any unwarranted, wrong, or inappropriate application of normal operating procedures demonstrated by the pilot during the mishap event sequence:

A4.4.22.1.1. Name of procedure:

A4.4.22.1.2. Description:

A4.4.22.2. Describe what the pilot was attempting to do prior to and during the mishap sequence of events:

A4.4.22.3. Name the emergency procedure and describe any unwarranted, wrong, or inappropriate application of emergency procedures demonstrated by the pilot during the mishap sequence of events:

A4.4.22.3.1. Name of procedure:

A4.4.22.3.2. Description:

A4.4.22.4. Under the circumstances, could alternative procedures have reasonably been used?

A4.4.22.4.1. If yes, were these alternatives practiced?

A4.4.22.4.2. If no, would decision times have been extended due to the number of alternatives and the lack of practice?

A4.4.23. Component Failure Indications and Response:

A4.4.23.1. Describe the indications to the pilot of component(s) failure, malfunction, or inoperability:

A4.4.23.2. Describe the pilot's actions in response to perceived indications of components inoperability, failure, or malfunction:

A4.4.24. Other Failures or Unusual Occurrences:

A4.4.24.1. Describe any system failures or flight integrity anomalies demonstrated after the beginning of the mishap sequence of events:

A4.4.24.2. Name and describe how any aircraft components (e.g., drag chute) were used by the pilot during the mishap event sequence:

A4.4.24.2.1. Item:

A4.4.24.2.2. Description of error:

A4.4.25. Anthropometric Problems. Name and describe any problems related to functional reach, field of view, sitting height, leg length, shoulder width, etc., in the mishap type aircraft. Work with the flight surgeon to evaluate these factors:

A4.4.26. Switch Characteristics. Name and describe any characteristics of cockpit switches (size, shape, color, location, motion, etc.) that may have contributed to errors of substitution, unintentional activation, reversal, forgetting, or adjustment:

A4.4.27. Control Characteristics. Name and describe any characteristics of cockpit controls (size, shape, color, location, etc.) that may have contributed to errors of substitution, unintentional activation, reversal, forgetting, or adjustment:

A4.4.28. Cockpit Display Characteristics. Name and describe any cockpit display characteristics (size, shape, symbology, location, glare, motion, etc.), which may have contributed to errors on the part of the pilot. Indicate which display was involved, such as warning lights, horns, or instruments, such as the HUD or attitude indicator:

A4.4.29. Cockpit Environment Characteristics. Name and describe any characteristics of the cockpit area, which may have reduced performance by increasing stress, fatigue, or levels of distraction. These may include such properties and conditions as temperature, pressurization, restricted movement, illumination, visibility, glare, noise, comfort, etc.:

A4.4.29.1. Did the pilot encounter any factors such as smoke, fumes, or unusual odors?

A4.4.29.2. Were there design problems in the cockpit that complicated management of the mission, the crew, or other members of the flight? If yes, what were they?

A4.4.30. Simulators:

A4.4.30.1. Is a simulator available? If yes, how was it used (frequency, types of events, etc.)?

A4.4.30.2. Was the simulator cockpit configuration different from the mishap aircraft? If yes, explain:

A4.4.31. Flight Manuals

A4.4.31.1. Did the crewmembers have the most current checklists, tech orders and instructions?

A4.4.31.2. Are there any 847s that have been submitted that may be related to this mishap?

A4.4.32. Reportable Mishaps. Has the pilot/crewmember been involved in a reportable mishap before? If yes, how many, type of most recent, and how long ago? (Indicate source and availability of data.)

A4.5. Maintenance Member Checklist and Questions:

A4.5.1. Introduction. The maintenance member evaluates the mechanical condition of the aircraft involved in the mishap. You may also be called on to comment on depot quality assurance, possible design deficiencies, depot management, as well as overhaul, acquisition, or modification philosophies. Further, you may be asked to work with the medical member to consider human performance factors which may have affected maintenance personnel. You have been selected to serve on this board based on your expertise in the mishap aircraft. You will be expected to objectively assess all logistical factors, both human and aircraft-related, prior to and throughout the mishap mission. The questions that follow are designed to help you assemble data and develop a strategy for pursuing the “machine” portion of the investigation. Your principle areas of interest include:

A4.5.1.1. Qualifications, proficiency, and training of maintenance and servicing personnel.

A4.5.1.2. Communications between maintenance personnel and the aircrew.

A4.5.1.3. Mechanical condition of all aircraft components throughout the mishap sequence.

A4.5.1.4. Special stresses on maintenance workers (time of day, weather, mission pressure, etc.)

A4.5.2. Common Challenges for the Maintenance Member. There are two types of mishaps where your task is particularly difficult: a mishap with no survivors and no obvious cause and a mishap that, on the surface, appears to be due to a straightforward “operations” problem (pilot error, etc.). In the

former case, remember there are only a finite number of reasons why an aircraft ceases to fly. Your job will be to identify (or rule out) the mechanical reasons -- loss of thrust, loss of lift, structural failure, fire, and so forth. In the latter case, it can sometimes be difficult to step back and consider how a minor mechanical problem, even something as simple as a “nuisance” caution light, can lead to aircrew errors and the eventual loss of an aircraft. If any system is degraded in any way, some flight regimes can make that degradation potentially far more serious. Keep an open mind, and keep as much emotional distance from the mishap sequence as possible. Remember, a safety investigation is designed to prevent recurrence, and you are crucial to the success of that mission.

A4.5.3. Maintenance/Service Human Performance Considerations. Although “human factors” traditionally have been a matter of concern when examining aircrew performance, they are equally applicable to the logistics side of the equation. Topics to be considered in cooperation with the flight surgeon may include physiological, psychological, psychosocial, or anthropometrical problems for maintenance personnel.

A4.5.3.1. Physiological problems may result from pre-existing illness, “self-imposed stresses” like alcohol or intoxicant use, fatigue, or excessive heat or cold.

A4.5.3.2. Psychological concerns include maintenance training or skill and knowledge. Issues of training, perception, attention, perceived stresses, fatigue, possible drug use, and life styles may warrant investigation.

A4.5.3.3. Psychosocial concerns include supervisory issues, communication, peer influences, and various personal and community factors.

A4.5.3.4. Even ergonomic concerns may be identified as possible factors in the mishap. Inadequate strength or inappropriate tool design to properly accomplish a task are examples.

A4.5.4. Checklist Technique. Make copies of the checklist. On one, take down all information you are able to develop from totally factual sources (flight data recorder output, examination of aircraft documentation, wreckage analysis, etc.). Then, take a clean, blank checklist to each interview of a participant in the mishap sequence. Once they have been given the opportunity to “tell their story” (see [Chapter 7](#) and [Attachment 5](#)), use the checklist as a guide for further information-gathering. Following the interview, make sure you can account for and resolve any discrepancies between the witness’ recollection and the information you obtained from factual sources. The checklist that follows is geared toward materiel failure factors, but also addresses a limited number of working conditions and supervisory issues that may suggest deficiencies in human performance. In general, these are the kinds of issues that will come to light in the course of the investigation, rather than being immediately recognizable. Should any of them appear to require closer examination, discuss them with the rest of the board before proceeding.

A4.5.5. Component Failure:

A4.5.5.1. Describe any component(s) of the aircraft that failed or malfunctioned during the course of the mishap:

A4.5.5.2. What was the reason for the failure or malfunction?

A4.5.5.3. Name and describe any component(s) of the aircraft that was or were inoperative before the mission.

A4.5.6. Aircraft Structural Failure:

A4.5.6.1. Describe any aircraft wing, fuselage, tail, appendage, or other structural failure that occurred during the course of the mishap:

A4.5.6.2. What was the reason for the structural failure?

A4.5.7. Support Equipment. For each of the following items of support equipment, describe any problems that may have increased workload, caused delays, or otherwise resulted in untimely or inadequate support. Briefly explain each answer:

A4.5.7.1. Electrical power cart:

A4.5.7.2. Towing equipment:

A4.5.7.3. Weapons (loading procedures or equipment):

A4.5.7.4. Refueling equipment:

A4.5.7.5. Oxygen-servicing equipment:

A4.5.7.6. Communications equipment:

A4.5.7.7. Other maintenance equipment:

A4.5.8. Servicing Resources (Field Working Conditions). For the following resources, name the specific type of resource and describe its availability, quality, quantity, or any other attribute that may have affected the mishap sequence of events. Indicate any problems induced, such as causing delays, frustrations, or malfunctions:

A4.5.8.1. Fuel:

A4.5.8.2. Engine oil:

A4.5.8.3. Hydraulic fluid:

A4.5.8.4. Aircraft availability:

A4.5.8.5. Parts availability:

A4.5.8.6. Ordnance (including release and suspension equipment):

A4.5.8.7. Tools:

A4.5.8.8. Oxygen:

A4.5.8.9. Pressurized air:

A4.5.8.10. Other:

A4.5.9. Logistics System Considerations. Comment on each of the following as observed in the supporting maintenance organization, or through examination of operational and failed equipment as appropriate:

A4.5.9.1. Depot quality assurance:

A4.5.9.2. Design deficiency (non-cockpit):

A4.5.9.3. Depot management:

A4.5.9.4. Overhaul philosophy:

A4.5.9.5. Acquisition philosophy:

A4.5.9.6. Modification philosophy:

A4.5.9.7. Risk acceptance (appropriateness, level at which decision was made, involvement of the using command):

A4.5.9.8. Other:

A4.5.10. Unit Supervision Issues. For each of the following, note discrepancies from accepted standards, or instances where accepted standards may be unsatisfactory given the mishap scenario:

A4.5.10.1. Manning levels:

A4.5.10.2. Shift work:

A4.5.10.3. Technical Training:

A4.5.10.3.1. Quality of instruction:

A4.5.10.3.2. Quality of courseware:

A4.5.10.4. On-The-Job Training:

A4.5.10.4.1. Quality of supervision:

A4.5.10.4.2. Appropriateness of task to level of skill expected/required:

A4.5.10.5. Training Management:

A4.5.10.6. Quality Assurance:

A4.5.10.7. Line Supervision (quality, knowledge, ability):

A4.5.10.8. Technical Data (currency, quality, usefulness, convenience during performance of tasks):

A4.5.10.9. Individual Worker Issues (qualification, discipline, work habits, etc.)

(NOTE: Any individuals who participated in, or could have been involved in, the mishap sequence should be immediately identified to the flight surgeon for 72-hour histories and appropriate toxicological testing.)

A4.6. Life Support Member Checklists and Questions:

A4.6.1. Introduction. The life support officer member (LSM) is the expert on and responsible for investigating personal equipment, egress, survival, and rescue issues. This includes aircrew training in such subjects as physiological issues, personal equipment use, survival, egress procedures, and rescue. The LSM acts as a consultant and auxiliary to the medical member throughout the investigation. One of the LSM's most valuable contributions is in the assembly of data for the Life Sciences Report on each crewmember. However, the LSM's principle expertise lies in their ability to identify malfunctions in egress, survival, or rescue equipment. Should any such deficiencies be found, regardless of their ultimate contribution to the mishap sequence, consult with HQ AFSC/SEFL immediately. Materiel deficiency reports and other investigative actions aimed at correction and prevention are not bound by the time constraints of the investigation. The LSM should review procedures characteristic of the overall mishap report to ensure the investigation and report are complete and thorough. Also review the LSR subjects in **paragraph A4.8.4.**

A4.6.2. Common Challenges for the Life support member. Generally, life support members are not assigned to SIBs unless there is a specific need for their expertise. The most common difficulties encountered usually are associated with the involvement of large numbers of participants, each of whose injuries and equipment status must be documented in detail in Tab Y.

A4.6.3. Checklist Technique. For all the following items, examine only those areas applicable to each involved crewmember.

A4.6.4. Oxygen (if high altitude flight was involved, investigate the system):

A4.6.4.1. Connections:

A4.6.4.2. Hose condition:

A4.6.4.3. Type regulator / setting (mark switch position; oxygen delivery may be checked in some cases):

A4.6.4.4. Type of mask:

A4.6.4.5. Charge in oxygen system:

A4.6.4.6. Contaminants in system (if any):

A4.6.4.7. Pressurization control equipment operation:

A4.6.5. Egress and Survival. For the purposes of safety investigations, the egress phase begins at the point where nothing the crew could do would prevent the mishap, or when the crew perceived an extreme condition that required abandoning their aircraft.

WARNING: Ensure all seat and canopy explosive components have been properly safed before working around them.
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A4.6.5.1. For ejection-capable aircraft:

A4.6.5.1.1. Was there canopy hinge or latch failure?

A4.6.5.1.2. Was an attempt made to jettison the canopy?

A4.6.5.1.3. Were the connections and function of the anti-G suit appropriate?

A4.6.5.1.4. Was protection from smoke and fumes available and adequate?

A4.6.5.1.5. Were ejection handles pulled (partly, fully)?

A4.6.5.1.6. Was the emergency harness release handle pulled?

A4.6.5.1.7. Were primary and secondary firing mechanisms, drogue gun, and/or main charges fired? Properly installed? Pins out?

A4.6.5.1.8. Did the time release mechanisms, barostat, G controller, inertial reel, and leg restraints function properly?

A4.6.5.1.9. Were shoulder harness and various restraints (gold key, etc.) attached? Was there evidence of failure?

How was the parachute deployed?

A4.6.5.1.10. Was the parachute damaged, and when (deployment, descent, or landing phase)?

A4.6.5.1.11. Was there a 4-line jettison?

A4.6.5.1.12. Was there any problem with the seat-chute or human-seat separation? What evidence (paint, line, or damage) is there of interference?

A4.6.5.1.13. What personal equipment was lost during egress?

A4.6.5.1.14. What personal equipment (helmet and clothing) damage occurred and how?

A4.6.5.1.15. Were there problems with equipment inventory? (Consider US Air Force or other authorization, availability in the mishap aircraft, and the phase of the mishap in which the item was used, needed, lost, discarded, or failed.)

A4.6.5.1.16. What items of personal equipment malfunctioned? (This may need to be reported immediately on discovery so corrective measures can be expedited.)

A4.6.5.2. For non-ejection-capable aircraft:

A4.6.5.2.1. Were escape hatches adequate in:

A4.6.5.2.1.1. Number?

A4.6.5.2.1.2. Location?

A4.6.5.2.1.3. Function?

A4.6.5.2.1.4. Ease of operation?

A4.6.5.2.1.5. Seating configuration?

A4.6.5.2.2. Were seats and restraints adequate in view of impact forces?

A4.6.5.2.3. Were chutes available and used?

A4.6.5.2.4. Was in-flight fire, toxic exposure, or pre-impact injury a factor in survival?

A4.6.5.2.5. What personal equipment problems were noted?

A4.6.5.2.6. What survival equipment problems were noted?

A4.6.6. Survival and Rescue. The survival phase begins when the aircrew reaches land or water.

A4.6.6.1. Notification/time of rescue unit(s):

A4.6.6.2. Arrival time of rescue unit(s) on scene:

A4.6.6.3. Completion time of rescue operations:

A4.6.6.4. Distance between rescue unit's base and mishap scene:

A4.6.6.5. Environmental conditions (weather, terrain, water, temperature, etc.) at rescue site:

A4.6.6.6. Rescue equipment used to notify rescuers:

A4.6.6.7. Rescue equipment used to locate survivors (mishap scene):

A4.6.6.8. Communication effectiveness and coordination at rescue area:

A4.6.6.9. Rescue vehicles or equipment used:

A4.6.6.10. Rescue techniques (include search methods and adequacy of methods):

A4.6.6.11. Rescue personnel used (pararescue, firemen, local/military, etc.):

A4.6.6.12. Did a physician participate? Include physician's actions:

A4.6.6.13. Medical support to survivors (include on-scene and follow-up medical care at medical treatment facility):

A4.6.6.14. Problems encountered by rescue forces:

A4.6.6.15. Survival equipment used by rescued individuals (automatic beacon, radio, flotation devices, smoke, etc.):

A4.6.6.16. Adequacy of equipment (positive or negative):

A4.6.6.17. Adequacy of rescued individuals' actions:

A4.6.7. Firefighting:

A4.6.7.1. Were firefighting vehicles adequate?

A4.6.7.2. Were unusual fire control measures required?

A4.6.7.3. Time at which fire was under control or extinguished:

A4.6.8. Evacuation (Transport or Helicopter Mishaps):

A4.6.8.1. Time required to accomplish egress (basis of time, i.e. testimony, firefighters logs, tower tapes, etc.):

A4.6.8.2. Usefulness of available emergency exits:

A4.6.8.3. Design of emergency exits:

A4.6.8.4. Availability of emergency exits:

A4.6.8.5. Number of people using each exit (correlate with seating position):

A4.6.8.6. On-board emergency equipment used:

A4.6.8.7. Would additional equipment have been helpful? How?

A4.6.9. Training:

A4.6.9.1. Were passengers and additional crewmembers (ACM) appropriately briefed?

A4.6.9.2. Were there problems with training in the use and maintenance of:

A4.6.9.2.1. Life support equipment?

A4.6.9.2.2. Personal equipment?

A4.6.9.2.3. Egress equipment?

A4.6.9.2.4. On-board emergency equipment?

A4.6.9.2.5. Survival equipment?

A4.6.10. Physiological Training. What were dates of:

A4.6.10.1. Survival training:

A4.6.10.2. "Helo dunker" (9D5 device) training:

A4.6.10.3. Egress training:

A4.6.10.4. Centrifuge Training:

A4.6.10.5. Other pertinent training (specify):

A4.6.10.6. Did any pilot participant in the sequence have a simulator ride within the past 24 hours? Yes/No (circle)

A4.6.11. Life Sciences Equipment Forensic Laboratory. Following the autopsy, life support equipment can be sent to the Life Sciences Equipment Forensic Laboratory at Brooks AFB for analysis. This laboratory supports SIBs and AIBs by conducting laboratory investigations of the Life Sciences Artifacts found at the mishap site (ejection seat, flight apparel and personal clothing). These investigations are tremendously helpful in determining such things as crewmember state of consciousness at the time of mishap, head and limb position at time of mishap, any potential failure of the Life Sciences Equipment, any abnormal physical contact or presence within the cockpit at time of or prior to the mishap, and aircraft escape system initiation and operation. Studies include: standard optical microscopy, comparison microscopy, forensic light source illumination, blood reagent testing, boroscopy, flight apparel overlay studies, and damage/marking plot studies of flight apparel. Through subcontractors, the laboratory also provides scanning electron microscopy/energy dispersive spectroscopy, radiography and chemical analysis. The laboratory can be reached at DSN 240-4722/3796. Their address is 7909 Lindbergh Drive, Bldg 578, Brooks AFB TX 78235-5352. Ensure that no pyrotechnics or ammunition are shipped with the gear.

A4.7. Medical Member Data-Gathering Checklist and Questions:

A4.7.1. Introduction. Typically, other members of your board will have occasion to move back and forth between the crash site and the workcenter frequently throughout the first week or two of the investigation. By contrast, the medical member's portion of the investigation can be clearly delineated into two phases: the "field" phase and the "analysis" phase. This checklist and the Life Sciences Report program will help to guide you through both phases. The burden on the SIB flight surgeon can be considerable. This burden is compounded if the mishap was a fatal one. It is strongly encouraged that only flight surgeons with previous experience as a medical member on a SIB be utilized as the SIB medical member for fatal mishaps.

A4.7.2. Medical Member Relationship with Other Board Members. Like the investigating officer, one of your primary functions is *synthesis*: interacting with the other members of the board on human performance issues and helping refine (or refute) theories of how the mishap sequence developed. There is not a separate "medical investigation" *per se*, although the complexity and level of detail that goes into Tab Y of the formal report sometimes makes it seem that way. Your development of full personal histories and your professional assessment of human performance factors that may have affected the sequence of events are critical elements that must be incorporated into the overall board report. However, it is usually not worth your time to develop and expand upon a specific theory of the mishap if it is not considered plausible by the other members of the board. The board process is, above all, a collegial process, bringing together expertise in a broad number of areas to arrive at a unified conclusion. Your work will be laborious and time-consuming; don't allow it to isolate you from the rest of the board. Be sure to make good use of your life support member as well as any consults you may have requested, such as an aviation psychologist or human factors consultant.

A4.7.3. Common Challenges for the Medical Member. There are two types of mishaps where your task is particularly difficult:

A4.7.3.1. A mishap with no survivors The rest of the board will be heavily dependent upon your assessment of the physical and psychological condition of the aircrew, most of which will have to be pieced together with lengthy interviews. Ask the SIB president to make available less heavily tasked members of the board (for example, the AFSC representative or the Commander's Representative) to conduct some of the personal background interviews, and save the ones with significant emotional components (such as family members and close friends) for yourself, the board president or the aviation psychologist. As a medical professional, you are generally better prepared than the other SIB members to maintain the necessary emotional distance, and will be less likely to identify with those you are interviewing. Also, in investigations with no survivors, information obtained from the life support forensic lab can be particularly useful.

A4.7.3.2. A mishap that initially, appears to be due to a straightforward "logistics" problem (mechanical failure, etc.). It can sometimes be difficult to recognize how individual actions can lead to mechanical failures. Depending on the component which seems to be at fault, either operations or maintenance personnel could have contributed to the eventual outcome and their human factors need to be assessed. As the investigation unfolds, be prepared to shift your attention from individuals to system design, operability, or maintainability issues as appropriate.

A4.7.4. Checklist Technique. Download the Life Sciences Report (LSR) Program and Instruction Manual from the Life Sciences page of the AFSC website:

<http://safety.kirtland.af.mil/AFSC/RDBMS/Flight/sefl/lifedown.html>. Keep track of the data obtained as the life support checklist is completed (begins at paragraph A4.20.4). Take down all information you are able to develop from totally factual sources (flight data recorder output, examination of aircraft documentation, wreckage analysis, etc.). Then, take a clean, blank checklist to each interview of a participant in the mishap sequence. Once they have been given the opportunity to "tell their story" (see **Chapter 7** and **Attachment 5** and **Attachment 6**, as appropriate), use the checklist and LSR program and manual as a guide for further information-gathering. Following the interview, make sure you can account for and resolve any discrepancies between the witness's recollection and the information you obtained from factual sources. Inconsistencies may point to problems of perception, temporal distortion, fatigue, task saturation, or other impediments to optimum performance. Be alert to suggestions of any of the following classes of problems during witness interviews:

A4.7.4.1. Physiological.

A4.7.4.2. Psychological.

A4.7.4.3. Psychosocial.

A4.7.4.4. Anthropometric/ergonomic.

A4.7.5. On-Scene Notes. Before departing for the autopsy make sure you have completely reviewed the medical chart and have made notes on the following:

A4.7.5.1. Chronology (for all mishaps).

A4.7.5.1.1. Year, month, and day of mishap sortie:

A4.7.5.1.2. Takeoff time-local (hours and tenths):

A4.7.5.1.3. Time of occurrence-local (hours and tenths):

A4.7.5.1.4. Time of occurrence-zulu (hours and tenths):

A4.7.5.1.5. Time of day (circle one): DAWN DAY DUSK NIGHT

A4.7.5.1.6. Percent moon illumination (if applicable):

A4.7.5.1.7. Day of week (circle one): SUN MON TUES WED THURS FRI SAT

A4.7.5.1.8. Holiday?: YES NO

A4.7.5.2. Terrain or Surface Background. Did the mishap take place over water or terrain and how may have that contributed to the mishap?

A4.7.5.2.1. Terrain type (desert land, flat land, forest land, farmland, mountains, paved surface, rolling slopes, snow-covered, swamp land, water; more than one may apply):

A4.7.5.2.2. Water state:

A4.7.5.2.3. Vegetation:

A4.7.5.2.4. Flight path obstacles:

A4.7.5.3. Visual Cue Data. What observations can you make concerning the following?

A4.7.5.3.1. Visual cue availability:

A4.7.5.3.2. Visual cue texture or detail:

A4.7.5.3.3. Presence of objects of known size:

A4.7.5.3.4. Presence of objects of deceptive size:

A4.7.5.3.5. Presence of objects of known location:

A4.7.5.3.6. Terrain gradient or slope:

A4.7.5.3.7. Shadows and sun angle:

A4.7.5.3.8. Landmarks:

A4.7.5.3.9. Presence of man-made obstructions:

A4.7.5.4. Life-support equipment. (Review the Life Support Section of the LSR Instruction Manual)

A4.7.6. Required Specimens. Take blood and urine only on survivors. Specimens on fatalities are best collected at autopsy. It is recommended that duplicate specimens be drawn and kept refrigerated until receipt of original specimens by AFIP is confirmed. A chain of custody for specimens must be maintained. Review requirements in either the LSR Instruction Manual or the AFIP Department of Forensic Toxicology website at <http://www.afip.org/oafme/afmi.html>. For victims who survive initially and later pass away, it is beneficial to submit both antemortem and postmortem samples.

A4.7.6.1. Blood: (Send to AFIP using wide-mouthed plastic specimen cups with screw on tops. Do not use any "tiger top" tubes. Should be kept unfrozen).

A4.7.6.1.1. 5-10 cc in red top tubes.

A4.7.6.1.2. 7-14 cc in gray top tubes.

A4.7.6.1.3. 7-14 cc in purple top tubes.

A4.7.6.2. Urine: 50-70 cc.

A4.7.6.2.1. Test for drug screen.

A4.7.6.2.2. Routine urinalysis.

A4.7.6.3. X-Rays.

A4.7.6.3.1. As needed on survivors.

A4.7.6.3.2. After all ejections, bailouts and crashes with or without suspected back injuries, full spinal radiographs are required.

A4.7.6.3.3. All remains on fatalities, for injuries and identification (including anterior-posterior and lateral of hands, feet, and spine).

A4.7.6.4. AFIP Toxicology - Frozen Tissue. Refrigerate all remains as soon as possible. Make sure each tissue specimen is individually packaged. Be sure to use polyethylene bags. Do not use plastic containers or cellophane-laminated plastic bags for any frozen specimens. Do not submit formalin-fixed tissue for toxicological analysis. Specific packaging and shipping instructions can be found at <http://www.afip.org/oafme/tox/toxguide98.pdf>.

A4.7.6.4.1. 100 - 200 g brain.

A4.7.6.4.2. 100 g liver.

A4.7.6.4.3. 50 g lung.

A4.7.6.4.4. 50 g kidney.

A4.7.6.4.5. 100 g skeletal muscle (if others are unavailable; psoas, perispinal, or deep thigh preferred).

A4.7.6.4.6. 100 g fat (if others are unavailable).

A4.7.6.4.7. 100 g bone marrow (if others are unavailable).

A4.7.6.5. Additional AFIP Toxicology - Frozen Fluids.

A4.7.6.5.1. Vitreous humor.

A4.7.6.5.2. Bile (as much as possible).

A4.7.6.5.3. Stomach contents (50 + cc).

A4.7.7. Required Paperwork.

A4.7.7.1. AFIP Form 1323, **AFIP/Division of Forensic Toxicology - Toxicological Request Form**, for each individual on whom specimens are submitted. AFIP Form 1323 can be found on the AFIP website: <http://www.afip.org/oafme/tox/1323blank.pdf>.

A4.7.7.2. SF 523, **Medical Record - Authorization for Autopsy**, for autopsy authorization.

A4.7.8. Specimen Handling.

A4.7.8.1. AFIP Toxicological Specimens. See LSR Instruction Manual or <http://www.afip.org/oafme/tox/contents.html> for details on all types of specimens.

A4.7.8.1.1. Blood and urine should be kept and shipped unfrozen.

A4.7.8.1.2. Keep the frozen tissue specimens in a freezer until dry ice arrives.

A4.7.8.1.3. Ship frozen in dry ice in an appropriate container which is vented to allow the release of CO₂ gas.

A4.7.8.1.4. Ensure that all specimen containers are leak proof.

A4.7.8.1.5. Support all specimen containers to ensure rattle proof package.

A4.7.8.1.6. Place the above paperwork inside the package, including an address for the board and for the authorizing commander.

A4.7.8.1.7. Seal the package with masking tape so that dry ice will last longer but allow CO₂ gas venting. This permits a transit time of 24 to 72 hours.

A4.7.8.1.8. Label packages for mailing (patient's name, SSAN, autopsy number, type specimen, hospital where taken, your name, and that of pathologist). Label the outside of the package with "Clinical/Diagnostic Specimens Enclosed" and "Shipment complies with U.S. domestic and IATA international packaging regulations." Make sure the term "biohazard" DOES NOT appear anywhere on the outside wrapping of the package.

A4.7.8.1.9. Do not send package by Registered, Certified, Air Freight, or "Return Receipt Requested" since these tend to significantly delay delivery.

A4.7.8.2. AFIP Notification. Notify AFIP of the following by message or phone before mailing:

A4.7.8.2.1. Aircraft mishap toxicology material:

A4.7.8.2.2. Patient's name, rank, SSAN:

A4.7.8.2.3. Method of shipment (air express, etc):

A4.7.8.2.4. Name of Washington DC airport to receive shipment:

A4.7.8.2.5. Name of airline:

A4.7.8.2.6. Flight number:

A4.7.8.2.7. GBL or airbill number:

A4.7.8.2.8. Contributor's name:

A4.7.8.2.9. Departure time and date:

A4.7.8.2.10. Arrival time and date:

A4.7.8.3. AFIP Mailing Address

A4.7.8.3.1. Armed Forces Institute of Pathology

Attn: Division of Forensic Toxicology, Bldg. 54

6825 16th Street, NW

Washington, DC 20306-6000

A4.7.8.3.2. Phone: Comm (301) 319-0100 or DSN 285-0100. Toll Free: 1-800-944-7912
Option 4

A4.7.8.3.3. Forensic Toxicology Guidelines available at:

<http://www.afip.org/oafme/afmi.html>

A4.7.8.3.4. Specimens are to be forwarded by the quickest means available (avoid military air, use an overnight delivery company).

A4.7.9. Post Mortem Considerations. If AFIP is expected to arrive, you can help by preparing to manage the specimens, by getting whole body x-rays (including anterior-posterior and lateral of hands, feet, and spine), by clearing the autopsy (through JAG, using SF 523, **Medical Record - Authorization for Autopsy**), and accomplishing identification if possible. Collect diagrams and photos of an intact cockpit; these will be useful to the medical examiners. Autopsy objectives are to determine who died, cause of death, manner of death, and what the specific interactions between victim and aircraft components were that may have constituted a fatal injury, or that may reflect on the sequence of events. AFIP will also perform an engineering autopsy upon request looking specifically at cabin/cockpit survivability issues.

A4.7.9.1. AFIP autopsy procedures follow this general outline:

A4.7.9.1.1. Clothing and external trauma first (correlate with personal equipment, pocket items or cockpit structure).

A4.7.9.1.2. Internal trauma (correlate similarly where possible).

A4.7.9.1.3. Preexistent disease.

A4.7.9.1.4. Forensic photography is inherent in each step of this process.

A4.7.9.2. Life Sciences Equipment Forensic Laboratory. Following the autopsy, life support equipment can be sent to the Life Sciences Equipment Forensic Laboratory at Brooks AFB for analysis. This laboratory supports SIBs and AIBs by conducting laboratory investigations of the Life Sciences Artifacts found at the mishap site (ejection seat, flight apparel and personal clothing). These investigations are tremendously helpful in determining such things as crewmember state of consciousness at the time of mishap, head and limb position at time of mishap, any potential failure of the Life Sciences Equipment, any abnormal physical contact or presence within the cockpit at time of or prior to the mishap, and aircraft escape system initiation and operation. Studies include: standard optical microscopy, comparison microscopy, forensic light source illumination, blood reagent testing, boroscopy, flight apparel overlay studies, and damage/markings plot studies of flight apparel. Through subcontractors, the laboratory also provides scanning electron microscopy/energy dispersive spectroscopy, radiography and chemical analysis. The laboratory can be reached at DSN 240-4722/3796. Their address is 7909 Lindbergh Drive, Bldg 578, Brooks AFB TX 78235-5352. Ensure that no pyrotechnics or ammunition are shipped with the gear.

A4.7.9.3. Preexistent Disease as a Contributor. This may be discovered from autopsy or medical record review. The medical record may disclose problems not easily identified at autopsy. Pathology pertinent to any waiver is of interest in order to help guide waiver policy.

A4.7.9.3.1. Primary systems of concern:

A4.7.9.3.1.1. Cardiovascular.

A4.7.9.3.1.2. Central nervous.

A4.7.9.3.1.3. Respiratory (including signs of smoke inhalation).

A4.7.9.3.1.4. Gastrointestinal (rupture with decompression, gastroenteritis, gallstones, etc.).

A4.7.9.3.1.5. Genitourinary (renal lithiasis or occult problems).

A4.7.9.3.2. Look for any disease which may cause sudden incapacitation.

A4.7.9.4. Survivability Considerations. It is important to determine if the mishap was potentially survivable. If there was a fatality in a survivable mishap the cause needs to be determined and recommendations made to prevent recurrence. The following factors are essential to survivability and need to be considered in your analysis:

A4.7.9.4.1. Tolerable decelerative and impact forces.

A4.7.9.4.2. Continued existence of a volume of occupiable space consistent with life.

A4.7.9.4.3. A non-lethal post crash environment.

A4.7.9.4.4. Effectiveness of life support equipment such as the helmet and clothing.

A4.7.9.4.5. Egress systems effectiveness; human-seat or human-chute interaction.

A4.7.9.4.6. Important aspects of crash survivability - "CREEP":

A4.7.9.4.6.1. C = container. Did the basic aircraft structure provide an intact shell around the occupant? Did it provide a habitable space while the rest of the CREEP factors worked to attenuate the crash forces and minimize post crash dangers?

A4.7.9.4.6.2. R = restraints. Refers to restraint of the occupants as well as restraint of aircraft equipment and components in the occupiable area.

A4.7.9.4.6.3. E = environment. Injury potential of objects and structures within restrained striking distance within the habitable space.

A4.7.9.4.6.4. E = energy absorption. Ability to reduce crash forces on the occupants by absorbing or reducing crash forces (stroking seats, etc.).

A4.7.9.4.6.5. P = post crash factors (ex. post crash fire).

A4.7.9.5. Injury Analysis. The following items should be incorporated into your analysis of the injuries incurred in the mishap:

A4.7.9.5.1. Analyze individual or groups of injuries in relation to the overall mishap scenario, i.e., how did one injury result in or cause other injuries; how do occupant injuries relate to aircraft deformation-that is, crushing of occupiable space or cabin elasticity during impact; and how did ejection, parachute landing fall injuries occur (mechanism).

A4.7.9.5.1.1. Injuries due to human-machine interaction should be identified by careful cockpit reference.

A4.7.9.5.1.2. Blunt force trauma. Look for imprints, and at fracture patterns, especially of the hands and feet.

A4.7.9.5.1.3. Correlate lacerations and abrasions with clothing, personal equipment, etc.

A4.7.9.5.1.4. Tissue may be obtained from cockpit surfaces. What type of tissue is it and how did it get there? (may require repeat searches of wreckage).

A4.7.9.5.1.5. Flail-like injuries. Injuries resulting from violent extremity movement in high-speed ejection (G forces). May be seen on occasion in non-ejection mishaps.

A4.7.9.5.1.6. Direction of forces. Injury patterns may help to determine the direction of forces or, conversely, known direction of forces can help determine injury etiology.

A4.7.9.5.2. Types of injury:

A4.7.9.5.2.1. Impact.

A4.7.9.5.2.2. Decelerative.

A4.7.9.5.2.3. Intrusive.

A4.7.9.5.2.4. Thermal.

A4.7.9.5.2.5. Other blunt trauma.

A4.7.9.5.3. Impact injuries. Investigate for control surface injuries. Injury patterns of the hands and feet may provide good evidence of who was controlling the aircraft at impact. Fractures of the carpal, metacarpal, tarsal, and metatarsal bones, with associated lacerations of the palms and soles, are classic.

A4.7.9.5.4. Decelerative injuries, the approximate G forces involved:

A4.7.9.5.4.1. Transection of aorta (horizontal at the ligamentum arteriosum)-80-100 G.

A4.7.9.5.4.2. Tears of aortic intima-50 G.

A4.7.9.5.4.3. Transect vertebra (horizontal)-200-300 G.

A4.7.9.5.4.4. Vertebral compression fractures (less force may be needed in the thoracic region or with poor body position)-20-30 G.

A4.7.9.5.4.5. Fractured pelvis-100-200 G.

A4.7.9.5.4.6. Fracture dislocation of C1 on C2 (fracture-disarticulation, subluxation, or a combination of both)-20-40 G.

A4.7.9.5.4.7. Human whole body impact tolerance limits (based on 250 G/sec onset rate):

<u>Direction of Impact</u>	<u>Load Limit Over Time</u>
+Gz (eyeballs-down)	25 G over 0.1 sec.
-Gz (eyeballs-up)	15 G over 0.1 sec.
+Gx (eyeballs-in)	45 G over 0.1 sec.
	83 G over 0.04 sec.
-Gx (eyeballs-out)(full restraint)	45 G over 0.1 sec.
	25 G over 0.2 sec.
-Gx (eyeballs-out)(lap belt)	13 G over 0.002 sec. (muscle strain)
	27 G over 0.002 sec. (injured bladder)
+/-Gy (eyeballs-left/right)	11.5 -20 G over 0.1 sec.

If the calculated crash forces on the airframe exceed the human tolerance limits by a factor of 2 or more, survivability is unlikely. If the limits are exceeded by a factor of 1.5, survivability is doubtful. If the limits are not exceeded, survivability is expected, although depen-

dent on individual variations and the CREEP factors (container, restraints, environment, energy absorption, post crash factors).

A4.7.9.5.5. Intrusion injury (loss of occupiable space):

A4.7.9.5.5.1. Rotor or propeller blade.

A4.7.9.5.5.2. Trees, wires, etc.

A4.7.9.5.5.3. Bird strike.

A4.7.9.5.5.4. Aircraft strike.

A4.7.9.5.6. Thermal injury:

A4.7.9.5.6.1. Burns and evidence of inhalation burns and soot in the airway may demonstrate true thermal injury.

A4.7.9.5.6.2. Artifactual injury may be demonstrated by:

A4.7.9.5.6.2.1. Pugilistic attitude.

A4.7.9.5.6.2.2. Soft tissue contraction and charring.

A4.7.9.5.6.2.3. Epidural hemorrhage.

A4.7.9.5.6.3. Thermal fractures of skull and extremities.

A4.7.9.6. Remains Identification.

A4.7.9.6.1. DNA.

A4.7.9.6.2. Dental records and x-rays.

A4.7.9.6.3. Finger and foot prints .

A4.7.9.6.4. Visual (often unreliable).

A4.7.9.6.5. Personal effects (often unreliable).

A4.7.9.6.6. Association or exclusion.

A4.7.9.6.7. For technical assistance in identification, contact Mortuary Affairs at HQ AFSVA/ SVOMM, Randolph AFB TX.

A4.7.10. Initial Personal History. This should be done for all crewmembers and anyone else thought to be potentially involved in the mishap (i.e. air traffic control or maintenance). For fatalities, this information must come from family, close friends and co-workers. In most cases, much of the personal history has already been collected through interviews performed by the ISB flight surgeon; be sure to review that information before proceeding with your own interviews. An additional flight surgeon (or perhaps another qualified assistant on the SIB such as an aviation psychologist or human factors consultant) may need to gather this information if autopsy or remains identification workload ties you up. This can be done in two steps, getting immediate information (details that may be forgotten as listed below) at the first interview and getting other details later. At the time of the first interview, establish empathy and caring support. Follow-up by asking for a future meeting. The Spouse or Friend Interview Guide ([Attachment 6](#)) may be useful. (If she or he departs, you may ask her or him to actually write out responses.) Do not think just in terms of 72 hours, but rather in terms of patterns over perhaps weeks.

A4.7.10.1. Before commencing interviews as the SIB's medical member it is best to first thoroughly review the medical chart, dental chart, and any mental health, family advocacy or substance abuse charts.

A4.7.10.2. Observe the following points to conduct a more effective interview:

A4.7.10.2.1. On the first interview keep your questions general and open-ended. You can get more specific later.

A4.7.10.2.2. Review the interview guide before the interview. Avoid "square filling" behavior using the guide in hand.

A4.7.10.2.3. Allow the subject (interviewee) to respond ad lib. Do not interfere with responses.

A4.7.10.2.4. Allow the subject to make associations to some factor other than the one you originally questioned, and come back later for completion.

A4.7.10.2.5. Pay attention to the person you are interviewing, look at them, encourage complete openness.

A4.7.10.2.6. Advise the subject to make a note of any stray thought they might like to comment on later.

A4.7.10.2.7. Before letting the subject go, look over your material and cover points overlooked or intentionally bypassed initially.

A4.7.10.2.8. Use a tape recorder. Most interviewees are very willing to be taped but always given them the choice. Be sure the sound quality is good, and the microphone location adequate.

A4.7.10.3. The 72-hour history is essential. Chart nutritional supplement, herbal preparation, prescription and non-prescription medication use. Chart alcohol intake as well. For purposes of charting, a snack is less than 500 calories, while a meal is over that.

A4.7.10.3.1. Food and Fluid Intake:

A4.7.10.3.1.1. Describe the food intake of the aircrew member for the 72 (especially 24) hours before the mishap flight:

A4.7.10.3.1.2. Was this diet characteristic of eating habits in the prior 2 weeks or so?

A4.7.10.3.1.3. Indicate the number of hours between last full meal and sortie:

A4.7.10.3.1.4. Was the crewmember on a diet? If yes, what type?

A4.7.10.3.1.5. What was the fluid intake of the pilot for the 24 hours before the mishap?

A4.7.10.3.2. Circadian Rhythm. Where had the pilot traveled within the past 72 hours? Describe their sleep/wake schedule including naps.

A4.7.10.3.3. Diurnal Cycle and Sleep:

A4.7.10.3.3.1. How many hours was the usual sleep period?

A4.7.10.3.3.2. Estimate the number of hours slept:

A4.7.10.3.3.2.1. In the 72 hours before the mishap sortie:

A4.7.10.3.3.2.2. In the 24 hours before the mishap sortie:

A4.7.10.3.3.3. What was the number of hours since last sleep period (excluding naps) before the mishap sortie?

A4.7.10.3.3.4. Did the mishap flight represent a change in the pupil's usual sleep/wake cycle? If yes, explain:

A4.7.10.3.4. Activity Levels. What were the types and levels of physical and mental activity of the pilot between the last regular sleep period and the mishap?

A4.7.10.3.4.1. Physical activity:

A4.7.10.3.4.2. Recreation:

A4.7.10.3.4.3. Mental activity:

A4.7.10.3.5. Tobacco Habits:

A4.7.10.3.5.1. What type of tobacco did the pilot use?

A4.7.10.3.5.2. How much daily?

A4.7.10.3.5.3. How long had the pilot used tobacco?

A4.7.10.3.5.4. Had the pilot's tobacco use habits changed recently?

A4.7.10.3.6. Alcohol Consumption:

A4.7.10.3.6.1. What were the pilot's normal drinking habits?

A4.7.10.3.6.2. How many drinks did the pilot consume within 24 hours of the mishap flight?

A4.7.10.3.6.3. Had the pilot's drinking habits changed recently? If yes, how?

A4.7.10.3.6.4. What was the time lapse between the pilot's last drink and his or her takeoff time?

A4.7.10.3.7. Drug Use. Was the pilot taking any nutritional supplements, herbal preparations, prescription or nonprescription medication before or during the mishap flight? If yes, what were the substances and the purpose and source for each?

A4.7.10.4. The 14 day history is useful in determining habit patterns and addressing longer-term fatigue issues. This is not as detailed as the 72 hour history.

A4.7.10.4.1. Circadian Rhythm. Where had the pilot traveled within the past 14 days? What had their duty schedule been like? Their sleep/wake cycle?

A4.7.10.4.1.1. Estimate the number of hours slept in the 7 days leading up to the mishap.

A4.7.10.4.1.2. Describe the crewmember's alcohol consumption pattern over the 7 days leading to the mishap.

A4.7.10.4.1.3. Any significant health, social, emotional, financial, duty or vacation events in the past 14 days?

A4.7.10.4.2. Describe extra duties and any education programs they may have participated in.

A4.8. Medical Member Data Consolidation Checklist and Questions:

A4.8.1. Day 3 to Day 10. Following disposition of remains and gathering of initial background 72-hour history you need to start working through the Life Sciences Report. Download the Life Sciences Report (LSR) Program and Instruction Manual from the Life Sciences page of the AFSC website: <http://safety.kirtland.af.mil/AFSC/RDBMS/Flight/sefl/lifedown.html>. You will address more general considerations extending weeks or longer into the pilot's past, and you will work with the life-support officer to evaluate egress and survival concerns. At this point, review the glossary (**Attachment 1**) if you have not yet found the time. Also, review the list of human factors terms and definitions (in the LSR and also in **Attachment 8**). "Human factors" is understood by some to be a synonym for "human error," and by others as being synonymous with "human engineering." For the purposes of this pamphlet, "human factors" is broadly defined as the whole spectrum of human performance and its inherent limitations in the industrial and aerospace environments.

A4.8.2. The Unit Member Survey (**Attachment 7**) may be used here either by you or by a consultant assisting you. The Spouse or Friend Interview Guide (**Attachment 6**) should be used to guide more detailed interviewing during this period, especially if the spouse plans to depart the area.

A4.8.3. If you do not have a life-support member on the board, you will need to seek local help in gathering data to assess egress and survival concerns. A life-support member workbook section (**paragraph A4.20.**) has been developed, but the questions to be addressed should be selected so that they are specific to the mishap aircraft, its mission and equipment.

A4.8.4. The Life Science Report program will guide you through the thought processes you will need during this phase of the investigation. We list below in a general sense areas that the LSR covers:

A4.8.4.1. Rated primary aircrew and others significantly involved in the mishap

A4.8.4.1.1. What is this person's name, rank, gender, and marital status?

A4.8.4.1.2. What is this person's source of commissioning (if commissioned)?

A4.8.4.1.3. How long has this person been on station?

A4.8.4.1.4. What was this person's crew position?

A4.8.4.1.5. Were the actions or inactions of this person part of the mishap sequence (integral to the mishap sequence of events)?

A4.8.4.1.6. Was this person in control of the aircraft at any time during the mishap sequence?

A4.8.4.1.7. Were there any significant events in this individual's 72 hour or 14 day histories that were a factor in this mishap?

A4.8.4.2. Rescue effort.

A4.8.4.2.1. Was this individual alive when the rescue team arrived?

A4.8.4.2.2. What was the physical condition of the individual when the rescue team arrived?

A4.8.4.2.3. Did the search and rescue operations cause any new injuries or increase the severity of existing injuries to this individual?

A4.8.4.2.4. Was the rescue started by notification efforts made by this individual?

A4.8.4.2.5. Were the rescue items available to the individual used correctly? (i.e. survival radio, flares, mirror, parachute, etc)

A4.8.4.2.6. Did any environmental, meteorological, or physical factor at the time of the rescue lower the quality or slow the speed of rescue operations?

A4.8.4.2.7. Did the procedures used by rescue personnel lower the quality or slow the speed of rescue operations?

A4.8.4.2.8. Did any training deficiencies of the rescue personnel lower the quality or slow the speed of rescue operations?

A4.8.4.2.9. What was the total time of from mishap occurrence to notification of rescue personnel?

A4.8.4.2.10. What was the total time from mishap occurrence to when the last person was actually aboard a rescue vehicle?

A4.8.4.2.11. What was the total time from mishap occurrence to the completion of the rescue (individual returned to station or hospital, etc) or rescue abandoned?

A4.8.4.2.12. Who was the owner of the first rescue vehicle to arrive at the mishap site?

A4.8.4.2.13. What was the first rescue vehicle to arrive at the mishap site?

A4.8.4.2.14. Who was the owner of the primary rescue vehicle used during the rescue?

A4.8.4.2.15. What was the primary rescue vehicle used in response to the mishap?

A4.8.4.3. Survival. After completion of air, ground or water egress, were any survival techniques used by the individual while awaiting rescue or recovery?

A4.8.4.4. Night vision devices.

A4.8.4.4.1. Did this mishap have a night vision device implicated as a factor in the mishap sequence?

A4.8.4.4.2. Was this individual wearing/using any personal night vision device during the mishap?

A4.8.4.4.3. Was an NVD expected to be used by this individual at the time of mishap occurrence?

A4.8.4.4.4. Was the use of a night vision device by this individual a factor in this mishap?

A4.8.4.4.5. How many night vision flights has this individual flown in the last 7 days?

A4.8.4.4.6. How many night vision flights has this individual flown in the last 15 days?

A4.8.4.4.7. How many night vision flights has this individual flown in the last 30, 60, and 90 days?

A4.8.4.4.8. How many total sorties, using night vision devices, has this individual flown at night?

A4.8.4.4.9. How many hours using night vision devices has this individual flown in the last 30, 60, and 90 days?

A4.8.4.4.10. How many hours has this individual flown at night using night vision devices?

A4.8.4.4.11. How many hours has this person flown using night vision devices with daylight filters?

A4.8.4.4.12. Was this individual current on required night vision device training ?

A4.8.4.4.13. Was the night vision device training completed by this individual appropriate/adequate for the mission requirements attempted??

A4.8.4.5. Anthropometrics.

A4.8.4.5.1. Did any anthropometric parameters of this individual contribute to the mishap sequence, or to any problem or injuries associated with the mishap?

A4.8.4.5.2. What is this person's weight?

A4.8.4.5.3. What is this person's height when standing?

A4.8.4.5.4. What is this person's sitting height?

A4.8.4.5.5. What is this person's dominant hand?

A4.8.4.6. Fatigue factors including crew rest and sleep times.

A4.8.4.6.1. Were crew rest requirements met?

A4.8.4.6.2. Did fatigue, of any type, contribute to the mishap?

A4.8.4.6.3. How many hours did the individual sleep in the past 24?

A4.8.4.6.4. How many hours did the individual sleep in the past 48?

A4.8.4.6.5. How many hours did the individual sleep in the past 72?

A4.8.4.6.6. How many hours was the individual continuously awake prior to the mishap?

A4.8.4.6.7. What was the duration of the individual's last sleep period?

A4.8.4.7. Duty time.

A4.8.4.7.1. At the time of the mishap, was this person beyond the defined crew duty day limitations?

A4.8.4.7.2. Was a waiver to the duty day limitations granted by a supervisor?

A4.8.4.7.3. Did time on duty contribute to this mishap?

A4.8.4.7.4. How many hours had the individual worked in the last 24?

A4.8.4.7.5. How many hours had the individual worked in the last 48?

A4.8.4.7.6. How many hours had the individual worked in the last 72?

A4.8.4.7.7. How many continuous hours of work were performed by this individual prior to the mishap?

A4.8.4.8. Injury.

A4.8.4.8.1. What were the extent of injuries to this individual?

A4.8.4.8.2. Describe the characteristics and anatomical location of each injury.

A4.8.4.8.3. Describe the causes of this injury, if known.

A4.8.4.8.4. Could this injury have been reasonably prevented or minimized?

A4.8.4.9. Laboratory tests.

A4.8.4.9.1. Were any laboratory tests positive or outside accepted limits?

A4.8.4.9.2. Were any of the positive laboratory tests a factor in this mishap?

A4.8.4.10. Human factors and life support training.

A4.8.4.10.1. Was this individual lacking or delinquent in any required human factor or life support training?

A4.8.4.10.2. Did any completed training courses provide training that was, or could have been, used by this individual during the mishap sequence, egress, survival, or rescue?

A4.8.4.10.3. Were there any other training related issues which were a factor in this mishap during egress, survival or rescue?

A4.8.4.11. Life support equipment.

A4.8.4.11.1. Did any piece of clothing, life support, restraint, or survival equipment used or available to the individual, contribute to the mishap sequence?

A4.8.4.11.2. Did any piece of clothing, life support, restraint, or survival equipment used or available to the individual, have an impact on egress?

A4.8.4.11.3. Did any piece of clothing, life support, restraint, or survival equipment used or available to the individual, have an impact on rescue or survival?

A4.8.4.12. Egress.

A4.8.4.12.1. General

A4.8.4.12.1.1. Was there an inadvertent loss of the canopy during flight?

A4.8.4.12.1.2. Was egress from the aircraft attempted?

A4.8.4.12.1.3. What were the intended results of the egress procedures started for or by this individual?

A4.8.4.12.1.4. Were there any significant problems during egress?

A4.8.4.12.1.5. How was the ejection system initiated?

A4.8.4.12.1.6. Was the ejection sequence, from initiation through parachute deployment, interrupted? (i.e. ground impact, aircraft debris, etc)

A4.8.4.12.1.7. What was the situation/attitude of the aircraft at time of ejection or manual bailout?

A4.8.4.12.1.8. What was the altitude MSL at the time of ejection?

A4.8.4.12.1.9. What was the altitude AGL at the time of ejection?

A4.8.4.12.1.10. What was the airspeed at the time of ejection?

A4.8.4.12.1.11. What was the pitch?

A4.8.4.12.1.12. In which direction was the pitch?

- A4.8.4.12.1.13. What was the pitch rate?
- A4.8.4.12.1.14. What was the roll angle at the time of ejection?
- A4.8.4.12.1.15. What was the roll direction?
- A4.8.4.12.1.16. What was the roll rate?
- A4.8.4.12.1.17. What was the yaw angle at the time of ejection?
- A4.8.4.12.1.18. What was the yaw direction?
- A4.8.4.12.1.19. What was the yaw rate?
- A4.8.4.12.1.20. What was the sink rate at the time of ejection?
- A4.8.4.12.1.21. Did this individual delay initiating ejection?
- A4.8.4.12.1.22. Was this delay reasonable or appropriate?
- A4.8.4.12.1.23. Did this delay cause injury or fatality?
- A4.8.4.12.1.24. Was the ejection in the envelope?
- A4.8.4.12.1.25. Were there any ejection system malfunctions?
- A4.8.4.12.1.26. Were any injuries caused by the ejection process?
- A4.8.4.12.1.27. Would any of the injuries have prevented successful escape and evasion in an operational situation?

A4.8.4.12.2. Landing

- A4.8.4.12.2.1. Were injuries sustained during parachute landing?
- A4.8.4.12.2.2. Was this individual dragged by the parachute? (land or water)
- A4.8.4.12.2.3. Was the parachute damaged during opening, descent, landing, or post landing events?
- A4.8.4.12.2.4. What was the total weight under the parachute during descent?
- A4.8.4.12.2.5. Were there any other significant egress difficulties experienced by the individual before, during, or after the initiation of the ejection sequence?

A4.8.4.12.3. Parachute

- A4.8.4.12.3.1. Did the parachute fully deploy without malfunction?
- A4.8.4.12.3.2. Were any injuries sustained during parachute deployment? (i.e. opening shock, riser entanglement, etc)
- A4.8.4.12.3.3. Was the “4 line jettison” or a similar technique for reducing oscillations and increasing steerability, completed by this individual in time for it to be effective before landing?
- A4.8.4.12.3.4. What type of terrain was the parachute landing made on?

A4.8.4.13. Human factors. There are 370 human factors terms listed and defined within the program. You will review, select, rank and correlate relevant human factors. See [Attachment 8](#) for a listing of terms and definitions.

A4.8.5. Psychological Performance. These questions are addressed by the medical member unless an aviation psychologist or human factors expert has been consulted. Every effort must be made to structure the questions so that they may be compared with available data on aircrew and so that the information gained is valid. If survey instruments are used, call HQ AFSC/SEFL (DSN 246-0871) to coordinate the appropriate method.

A4.8.5.1. Supervisory Activity:

A4.8.5.1.1. Who was the primary supervisor? (level, position, rank):

A4.8.5.1.2. Was supervisory guidance a factor in the mishap? If yes, explain:

A4.8.5.1.3. What was the quality of first level of supervision?

A4.8.5.2. Rule Perceptions and Supervisory Example:

A4.8.5.2.1. Was the example set by supervisors supportive of the rules? If no, explain:

A4.8.5.2.2. Was the supervision in the unit consistent with the mission of the unit? If no, explain:

A4.8.5.2.3. Was the supervision in the unit consistent with the configuration of the unit? If no, explain:

A4.8.5.2.4. What is your assessment of the perceptions of unit members concerning how often and why rules were violated? (Unit Member Survey may be used, see sample in [Attachment 7](#)).

A4.8.5.2.5. Were there any problems with crew or flight coordination as they relate to the mishap sequence of events?

A4.8.5.2.6. Did the pilot or any crewmember exhibit the copilot syndrome? If yes, who and how?

A4.8.5.3. Sensory Information Processing? How would you account for any problem the pilot had with processing, or acting on sensory information?

A4.8.5.3.1. Orientation:

A4.8.5.3.2. Hearing:

A4.8.5.3.3. Eyesight:

A4.8.5.3.4. Smell:

A4.8.5.3.5. Touch:

A4.8.5.3.6. Proprioception:

A4.8.5.4. Learning and Memory. Describe the pilot for each of the following: (If Spouse or Friend Survey, [Attachment 6](#), is used, report average and number of respondents).

A4.8.5.4.1. Learning ability:

A4.8.5.4.2. Learning transfer:

A4.8.5.4.3. Procedural knowledge:

A4.8.5.4.4. Cognitive or mental flexibility:

A4.8.5.4.5. How did the pilot's capabilities change under fatigue or stress?

A4.8.5.5. Information Processing. Were there any problems noted with information processing on the part of the pilot before or during the mishap flight?

A4.8.5.6. Awareness Factors. Did the level of awareness at which the pilot was functioning play a role in the mishap sequence of events? How?

A4.8.5.7. Level of Attention. Was the level of attention a factor? If yes, describe how attention was managed:

A4.8.5.8. Anomalies of Attention. For each of the following aspects of attention, indicate if and how they played a role in the mishap sequence of events:

A4.8.5.8.1. General inattention (complacency, boredom):

A4.8.5.8.2. Selective inattention:

A4.8.5.8.3. Channelized attention:

A4.8.5.8.4. Fascination:

A4.8.5.8.5. Distraction:

A4.8.5.8.6. Habit pattern interference (perceptual or response set):

A4.8.5.8.7. Confusion:

A4.8.5.8.8. Cognitive saturation:

A4.8.5.9. Coping Style:

A4.8.5.9.1. Have there been any perceived personality changes in the pilot since his or her arrival with the unit? If yes, describe:

A4.8.5.9.2. Did the pilot tend to change personalities when flying or driving? If so, how?

A4.8.5.9.3. Was there any personality factor that influenced the mishap sequence of events, including before the mishap flight?

A4.8.5.9.4. How would you evaluate the pilot's ability to function under stress and ability to maintain presence of mind?

A4.8.5.9.5. Could the pilot set priorities effectively? If no, explain:

A4.8.5.9.6. Were there aircraft design features which detracted from his or her ability to set priorities?

A4.8.5.10. Previous Experience. What was the pilot's history of involvement in pursuits which require good vision and the establishment and maintenance of situational awareness?

A4.8.5.11. Social Companions. What were the pilot's most common social activities (Divide 100 points among the following to establish a rough percentage of each)?

A4.8.5.11.1. Family:

A4.8.5.11.2. Friends:

A4.8.5.11.3. Peers:

A4.8.5.11.4. Church:

A4.8.5.11.5. Social groups:

A4.8.5.11.6. Cultural groups:

A4.8.5.11.7. Recreational groups:

A4.8.5.12. Career Progression:

A4.8.5.12.1. Was career progression normal compared to peers? If no, explain-

A4.8.5.12.2. How did the individual feel about his or her career progression?

A4.8.5.13. Peer Assessment. (From Unit Member Survey, sample in [Attachment 7](#)).

What were the fellow pilots estimates of his or her general leadership qualities relative to peers?

EXTREMELY LOW 1 2 3 4 5 6 7 EXTREMELY HIGH

What was the peer assessment of the pilot's susceptibility to peer influence or pressure?

EXTREMELY LOW 1 2 3 4 5 6 7 EXTREMELY HIGH

How did the pilot's peers rate him or her as an officer?

EXTREMELY LOW 1 2 3 4 5 6 7 EXTREMELY HIGH

How did pilot's peers rate him or her as a pilot?

EXTREMELY LOW 1 2 3 4 5 6 7 EXTREMELY HIGH

What were the pilot's peers estimate of his or her flying skills relative to peers?

EXTREMELY LOW 1 2 3 4 5 6 7 EXTREMELY HIGH

A4.8.5.14. Rules Conformance:

A4.8.5.14.1. Did the pilot tend to bend the rules? If yes, what would be his or her rationale? (Motivation?)

A4.8.5.14.2. Were there any violations of rules, instructions, regulations, or procedures in the past? If yes, how?

A4.8.5.14.3. Were there any violations of rules, instructions, regulations, or procedures on this mishap? If yes, how?

A4.8.5.14.4. What other factors may have been involved in bending the rules (supervision, fatigue, expectations, etc.)?

A4.8.5.15. Crew Relations (Crew/Cockpit Resource Management):

A4.8.5.15.1. Were there any noticeable conflicts between the pilot and other crew or flight members before or during the mishap flight. If yes, explain:

A4.8.5.15.2. What characterized the usual attitude of the pilot toward other crewmembers?

A4.8.5.15.3. Did the attitude of the pilot toward other crew or flight members influence their behavior during the mishap flight? If yes, how?

A4.8.5.15.4. Did the pilot appear to have effectively used other crew members during the mishap flight? If not, why?

A4.8.5.16. Unit Morale. Comment on the level of unit morale:

A4.8.5.17. Personal Relations:

A4.8.5.17.1. Were there any problems or conflicts the pilot was having with close personal relationships?

A4.8.5.17.2. Did any deaths, injuries, or illnesses in the family or friends affect the operator? If yes, describe the effect:

A4.8.5.18. Personal Problems. Indicate the presence of and describe any personal problems related to changes or anticipated changes in any of the following:

A4.8.5.18.1. Financial status:

A4.8.5.18.2. Legal problems:

A4.8.5.18.3. Job status:

A4.8.5.18.4. Religious problems:

A4.8.5.18.5. Marital problems or status:

A4.8.5.19. Personal Motivation:

A4.8.5.19.1. Why did the pilot want to fly?

A4.8.5.19.2. What was the pilot's source of motivation regarding the mishap flight?

A4.8.5.19.3. What was the pilot's source of professional or career motivation?

A4.8.5.20. Satisfaction. Indicate the pilot's level of satisfaction in the following areas by circling the appropriate number where 1 is *Extremely Satisfied*, 4 would indicate Neutral and 7 is *Extremely Dissatisfied*:

Career choice	1	2	3	4	5	6	7
Duty location	1	2	3	4	5	6	7
Type aircraft assignment	1	2	3	4	5	6	7
Ground duties	1	2	3	4	5	6	7

A4.8.5.21. Emotions and Moods:

A4.8.5.21.1. Did the pilot experience any intense emotion before or during the mishap flight? If yes, describe:

A4.8.5.21.2. Describe the mood of the pilot before and during the mishap flight:

A4.8.5.21.3. Describe any emotional displays on the part of the pilot before or during the mishap or mission flight:

A4.8.5.21.4. Did the pilot have a recent history of significant changes in moods or emotions? If yes, explain:

A4.8.5.22. Behavioral Factors:

A4.8.5.22.1. Did the pilot seem depressed recently? If yes, why?

A4.8.5.22.2. Did the pilot seem anxious recently? If yes, why?

A4.8.5.22.3. Was the pilot's behavior noted to be unusual before or during the mishap flight? If yes, explain:

A4.8.5.23. Unit Member's Perceptions (if accomplished). For the following areas, describe the representative unit member's perceptions (perhaps from questionnaire aids or modifications thereof, see [Attachment 7](#)). If used, report average rating and number of respondents:

A4.8.5.23.1. Reliability of aircraft:

A4.8.5.23.2. Adequacy of aircraft systems and subsystems:

A4.8.5.23.3. Reliability of egress systems:

A4.8.5.23.4. Adequacy of training:

A4.8.5.23.5. Adequacy of flying time:

A4.8.5.23.6. Adequacy of scheduling:

A4.8.5.23.7. Adequacy of unit leadership:

A4.8.5.23.8. TDY frequency:

A4.8.5.23.9. TDY duration:

A4.8.5.23.10. Additional duties:

A4.8.5.23.11. Promotion system:

A4.8.5.23.12. Multiple-mission roles:

A4.8.5.23.13. General job satisfaction:

A4.8.5.23.14. Unit dynamics (competitive, cliquish, etc.):

A4.8.5.23.15. Unit professional standards:

A4.8.5.23.16. Career progression potential:

A4.9. Medical Member Tab Y Suggested Template:

A4.9.1. Part I Narrative. Part I of the narrative will include a discussion of all human factors or medical conditions investigated and found to be a factor in the mishap. Also, include any life support equipment problems or issues that were a contributory factor to the mishap sequence, and any human factor, medical, life support, egress, survival, or rescue problems that followed or were a result of the mishap sequence. Do not include negative or rule out discussions. The LSR program generates and stores "reminders" when items relevant for discussion in the narrative are entered into the program. Part I should include a discussion of all these "reminders" but is not limited to a discussion of only those factors if in your investigation you found other factors, not indicated in the Life Science Report, that were factors in the mishap. Also include any items that were significant to the mishap in the 72

hour and 14 day history for any individuals involved in the mishap. The histories should contain the significant events and contextual entries. Note: The individual's 72 hour & 14 day history should be investigated fully, however, in the narrative, only report events that are significant to the mishap. If you are not sure of the significance of an event or activity report it and explain in the significance column. Findings and recommendations, from Part I, determined to be significant must also be discussed and incorporated into appropriate sections of Tab T and included in Tab T findings and recommendations as appropriate.

A4.9.2. Part II Narrative. Part II of the narrative is for discussion of issues and factors discovered during the investigation which, although not relevant to this mishap, may have future safety value OR discussion of key issues or factors that were ruled out. Include only events investigated and found not to be a factor in the mishap sequence, egress, survival, or rescue. Negative or rule out discussions may be included in this part if determined by the investigator as necessary to document for readers that potential factors were fully investigated before being ruled out. Also Part II should contain discussions of life science and life support factors that, although not a factor in this mishap, could be predisposing to future mishaps. Include any life support equipment problems or issues that were not a factor in the mishap sequence (design through rescue) but were discovered during the investigative process and need to be resolved by the responsible agency to prevent problems or mishaps in the future. Findings and recommendations of other significance, from Part II, must also be discussed and incorporated into appropriate sections of Tab T and included in Tab T findings and recommendations of other significance as appropriate.

A4.9.3. See **Figure A4.1.** for a typical structure of Tab Y.

A4.10. Last Minute Reminders:

A4.10.1. What is the status of toxicology or histology specimens submitted for analysis?

A4.10.2. Remember, if there are any uncertainties in medical, psychological, or life-support or egress equipment analysis, call now to discuss it. (Call HQ AFSC/SEFL, DSN 246-0830, Commercial (505) 846-0830.)

A4.10.3. Hazardous Substances. Check with Bioenvironmental Engineering concerning any possible composite material hazards, residual radioactive sources (such as in night systems) or hazardous chemicals (such as hydrazine) to ensure proper disposal. (See Life Support Member checklist (**paragraph A4.20.**) if you have no life-support member on the board.)

Figure A4.1. Tab Y Structure.

- I. Part I Narrative (for discussion of issues and factors integral to the outcome of this mishap)
 - A. Brief Mishap Summary (Part I Only)
 - B. Human Factors Related Issues
 - 1. Broad Category: Specific Factor: Human Factor Code (as appropriate)
 - a) Discussion
 - b) Analysis
 - c) Conclusion
 - 2. Broad Category #2...
 - C. Life Support Issues
 - 1. Egress/Survival/Rescue Summary (Brief detailed summary of events including procedures done correctly or incorrectly)
 - 2. Category/Issue # 1(Use titles as directed in LSR as appropriate)
 - a) Discussion (what went wrong and how it went wrong)
 - b) Analysis (why it went wrong)
 - c) Conclusion (improvements, prevention)
 - 3. Category/Issue #2 ...
 - D. Injury Issues (Only injuries that could have been prevented by changes in training, procedures, design etc. needing further discussion outside Life Sciences Report)
 - 1. Issue # 1
 - a) Discussion
 - b) Analysis
 - c) Conclusion
 - 2. Issue # 2 ...
 - E. Other Issues
- II. Part II Narrative (For discussion of issues and factors discovered during the investigation which, although not relevant to this mishap, may have future safety value OR discussion of key issues or factors that were ruled out)
 - A. Non-factors Worthy of Discussion (Same format as above)
 - 1. Human Factors Issues
 - 2. Life Support Issues
 - 3. Injury Issues
 - 4. Other Issues
- III. Life Sciences Reports
 - A. Individual #1
 - B. Individual #2 ...
- IV. Consultant Reports
 - A. Human Factors
 - B. Life Support
- V. Appendices
 - A. Post-Mishap Medical Evaluation Summary
 - 1. Individual #1
 - a) Medical Findings
 - (1) Summary of Injuries (List)
 - (2) Summary of Significant Lab/X-ray (short narrative)
 - b) 3 and 14 day Histories
 - c) Long Term Prognosis/Follow up (short narrative)
 - 2. Individual #2 ...
 - B. Medical Documents (AFSC copy only)
 - 1. Individual #1
 - a) Past two physicals (one must be a long)
 - b) Post-mishap physical/Autopsy report
 - c) Toxicology Reports
 - d) Other laboratory reports
 - e) Other X-ray reports
 - 2. Individual #2 ...

Attachment 5

TECHNIQUES FOR CONDUCTING WITNESS INTERVIEWS

Section A5A—Arranging the Interview

NOTE: If a member of the SIB suspects a potential witness was criminally involved in the mishap, the witness should not be interviewed and the board president notified immediately. If at any time during a witness interview the interviewer concludes that the witness may have committed an offense under the Uniform Code of Military Justice, the interviewer should cease recording, terminate the interview, and contact the board president. In all such cases, the board president will consult HQ AFSC/JA and AFI 91-204 for further actions to be taken.

A5.1. Personal Contact. When designated to conduct an interview, you should proceed as follows:

A5.1.1. Contact the witness by phone, introduce yourself, and explain the purpose of the investigation and interview.

A5.1.2. Stress that you represent the USAF SIB and that the witness may have information relevant to establishing the facts.

A5.1.3. Arrange to see the witness promptly. Use a positive approach, e.g., "I know you will want to talk to me as quickly as possible while the facts are still fresh in your mind," rather than, "I don't suppose you could find time to talk to me today."

A5.1.4. Set an interview time and avoid postponements. Witnesses' memories degrade as time passes.

A5.2. General Preparations:

A5.2.1. Obtain as much background information as possible on the witness and on the circumstances relating to the occurrence.

A5.2.2. Visit the site of the occurrence/observation so you can base the questioning of witnesses on firsthand understanding of the environment. Use your own observations at the scene, such as magnitude of impact, indications of (or lack of) power, impact attitude, fire, wreckage scatter, etc., as the basis for areas of questioning involving unusual sounds, engine noise, flight maneuvers, in-flight fire, in-flight structural failures, etc. Use this list of questions as a checklist or reminder, but do NOT ask leading questions.

A5.2.3. Select a location for the interview that is conducive to eliciting information:

A5.2.3.1. Normally, the best place is where the witness was during the mishap; however, particularly with potentially wary civilian interviewees, it is sometimes helpful to offer to first meet them in a "neutral" location (e.g., their home or workplace, a public location like a restaurant, etc.) in order to build trust.

A5.2.3.2. Associates of the witness should be kept away from the interview location unless they will also be interviewed; in those cases, ensure you arrive first, and interview associates one by one, privately, at the designated location.

A5.2.3.3. Avoid questioning potentially hostile witnesses on their home ground; sacrifice their comfort for more positive control of the interview, but do not intimidate them with multiple interviewers, a severely formal setting, etc., unless absolutely necessary.

A5.2.4. Do everything possible to prevent intimidating the witness.

A5.2.4.1. Multiple interviewers can be intimidating and should not generally be used except for “formal interviews” (see [Chapter 7](#)).

A5.2.4.2. Junior military personnel frequently are more open with lower-ranking officer board members; consider arranging interview assignments accordingly.

A5.2.5. Assemble and check your interview kit (see [Chapter 7](#)) prior to departing the workcenter. Become familiar with and test your recording equipment; if the recording device must be operated on internal batteries, replace the batteries with fresh ones before the interview.

A5.2.5.1. Private room

A5.2.5.2. Tape recorder

A5.2.5.3. Microphone

A5.2.5.4. AC adapter

A5.2.5.5. Tapes

A5.2.5.6. Spare batteries

A5.2.5.7. Statement forms

A5.2.5.8. Model air craft

A5.2.5.9. Water and cups

A5.2.5.10. Chairs

A5.2.5.11. Steno notebook

A5.2.5.12. Extra paper

A5.2.5.13. Pens

A5.2.5.14. Tissues

A5.2.5.15. Phone/beeper off

A5.3. Review of Interviewing Techniques:

A5.3.1. Make a list of known facts, identifying missing facts the witness could potentially shed light upon; build a list of questions that need asking based on this list.

A5.3.2. Focus initial questioning on what happened and general areas. Start with “open ended” questions (those that begin with who, what, when, how long...) rather than closed ended questions that can be answered by a “Yes” or “No.”

A5.3.3. Prepare a list of questions in conjunction with SIB board member inputs prior to the interview.

A5.3.4. Plan on having the witness doing most of the talking.

A5.3.4.1. The best way to do this is to invite them to tell you their entire story, beginning to end, without interrupting them to ask questions. Take brief notes, but don't speak unless absolutely necessary. Maintain friendly eye contact as much as possible.

A5.3.4.2. When they've finished, go over your notes silently for about a minute, then ask them a few general questions based on what they've told you before moving on to your prepared questions.

A5.3.4.3. One method for keeping a witness talking without a direct question from the interviewer is the pause. The pause is best employed following an assertion by the witness. Pauses as long as 10 to 40 seconds may be effective.

A5.3.5. Let the witness elaborate on any pertinent details your planned list of questions doesn't address.

Section A5B—Conducting the Interview

A5.4. Meeting the Witness/Setting the Stage:

A5.4.1. Introduce yourself, restate your mission, and answer any questions that the apprehensive witness may ask before starting the interview. Make it clear that they are not testifying under oath, and that the purpose of your questioning is solely for the prevention of future mishaps. Ensure they understand the difference between the SIB and the AIB.

A5.4.2. Establish rapport, put the witness at ease, and reconfirm what you know about the witness's experience and background. Witness information should include full name; rank or title, SSAN, organization and home installation (if in the military service); home address (if a civilian); and duty currently performed/civilian employment as appropriate. Include any aeronautical or other experience that would help establish witness competence. Identify the location from which the witness viewed the events.

A5.4.3. Set up your tape or video recorder; taking copious notes during an interview can intimidate a witness, interfere with the flow of information, and add to the length of the interview. A more efficient procedure is to record the interview and later transcribe the taped statement into a summary when it is convenient.

A5.4.3.1. Videotaping can intimidate a witness. Explain that it is used to permit the capture explanations that require hand motions or manipulating a model aircraft or other piece of equipment.

A5.4.3.2. Although the first few minutes of a taped interview may make the person being interviewed feel "on the spot" or awkward, this is usually a transient condition, and the remainder of the interview will be as candid as if unrecorded.

A5.4.3.3. It is good technique to let the witness know they control the use of the recorder, and that they may ask for it to be turned off at any time. In practice, they rarely exercise this option. However, it helps the interviewee feel a modest sense of control, and also allows emotional witnesses the courtesy of collecting themselves periodically. The interviewer should immediately comply with such a request, then diplomatically attempt to restart the tape at the first opportunity.

A5.4.4. If the interview is considered confidential, begin your recording by taping the required advisory information (**paragraph 7.2.1.**). (Note: This must be accomplished at the beginning of each privileged interview, even if the witness has already been interviewed and heard this advisory.) A good

technique is to let the interviewee read the statement and explain it to him/her before starting the official interview. In any case, after starting the recording always give a brief introduction with the names of the interviewers, interviewee and the date. Then read the advisory and ask if they understand. This not only allows the witness time to relax in the presence of the tape or video recorder, but it also ensures their proper identification and assists the transcribing/ summarizing process.

A5.4.5. If a tape recorder is the sole means of recording a witness statement, the interviewer should take precautions to guarantee an intelligible and complete interview recording.

A5.4.5.1. When a recording is made outdoors, environmental noise, such as aircraft operating nearby or windy conditions, may seriously impair the clarity of what is said. Therefore, conduct interviews at locations free of this kind of distraction if possible.

A5.4.5.2. When using a mini-recorder and short tape, determine if the unit has an end-of-tape warning device. Otherwise, the tape can run out unnoticed and not record essential information.

A5.5. Obtaining Testimony. Successfully interviewing witnesses is primarily an application of common sense. Show each witness the same courtesy and consideration you would appreciate if the situation were reversed. Encourage the witness to tell the story in his or her own way without questions, comments, suggestions, or interruptions. Periods of silence while the witness collects his or her thoughts can encourage the witness to expound more fully and avoid omissions. The interviewer's ability to be a good listener and keep the witness talking is essential in this phase. If possible, do not interview more than one witness at a time nor allow one to hear the statement of the other since it may influence that witness. Use simple, non-technical, non-aviation terms during the interview, and add explanatory notes putting the witness' description of events into standard terminology after the interview is concluded. Follow the following guidelines in questioning:

A5.5.1. Start with what the witness knows first. Let the witness talk, and when he or she finishes, then ask questions. Talk as little as possible; they will tell you what is most important to them first, and you can get to the areas that interest you later.

A5.5.2. When the witness finishes the story, have them start all over again. They may be bothered by this, but tell them you recognize the difficulties of human memory, and he or she will be surprised at the ability to recall new things.

A5.5.3. Once you're ready to ask questions, keep them short and to the point, but do not lead the witness. A good first question for uninvolved ground observers is, "What first drew your attention to the aircraft?"

A5.5.4. Ask one question, and allow the witness to respond fully before asking a second question; that may mean waiting or prompting before moving on.

A5.5.5. Arrange and ask your questions in a logical sequence. Progress from one question to another question in a given area and from one area to another area.

A5.5.6. It is perfectly appropriate to go from general to specific in your questioning, as long as you do so without leading. For example, if you have physical evidence that suggests an in-flight fire occurred in a mishap aircraft's left engine, attempt to confirm it with an eyewitness by gradually asking more specific questions, i.e., "Did you notice anything unusual about the aircraft?"; "Did you notice flashing, glowing, or smoke?"; "Where on the aircraft did it look like this smoke was coming from?"

A5.5.7. Allow witnesses the freedom to discuss answers rather than restricting them to short responses.

A5.5.8. Witnesses with no aviation experience often have difficulty in describing maneuvers that they saw the aircraft perform. If a model airplane is available, they can use it to express themselves and demonstrate these maneuvers instead of trying to describe them. (This technique is valuable in securing evidence from even the most experienced witnesses if they are trying to describe a midair collision.)

A5.5.9. Keep the witness focused on their personal observations. If they report that someone else described the occurrence, take the name, and contact the person at a later date.

A5.5.10. Be careful about terminology. Do not use aeronautical terms unless you know the witness will understand them.

A5.5.11. Do not assume you know what the witness means when describing what they saw; go for the maximum amount of detail possible, and ensure they are using aeronautical terminology correctly before accepting specific assertions about maneuvers or structures.

A5.5.12. On second interviews, play the critical segment of the tape back for the witness and then ask if they remember any more details. If so, tape the new information.

A5.5.13. Encourage the witness to clarify their statement by using a sketch or by reference to maps or photographs. Include these sketches, photos, or maps as exhibits, and refer to the exhibit number in the statement. Have the witness talk you through such a sketch or diagram right on the tape; identify locations mentioned in testimony on the map or photograph.

A5.5.14. Respond carefully to witness questions. Be truthful but do not reveal any information obtained during the investigation. During the last part of the interview, the witness may look to you for support, validation, or feedback; "I don't know," "We don't know that yet", "That's what we're trying to find out", may be appropriate responses.

A5.5.15. Establish and maintain a polite but professional rapport with the witness; do not show disbelief, disrespect, or anger toward either the witness or their responses.

A5.5.16. Courtesy is important in concluding the witness interview. Thank witnesses for their cooperation and time in providing the information and statements. Leave a phone number and address where you can be reached should the witnesses recall additional information they failed to include in their statements. Make sure they understand that the AIB may also interview them at a later date. Explain the differences in the two processes if appropriate. Educating witnesses on the distinct differences between the SIB and AIB is often important and helps get useful testimony for both boards; it helps to build rapport and trust as well.

A5.6. Post-Interview Actions:

A5.6.1. After obtaining statements and testimony, review them to determine which need to be typed verbatim, and which can be synopsised by a board member. *Caution:* While the testimony can be summarized, the board must be very careful. Leaving out any essential statements can be detrimental to the overall findings and conclusions of the SIB. Recommend that testimony from mishap participants and/or persons found causal in the mishap be included in their entirety.

A5.6.2. After the interview is transcribed, it is essential for one of the board members to review the taped interview along with the transcript to ensure that the interview has been transcribed exactly.

A5.6.3. Edit out verbal pauses, repeats, and non-applicable comments; identify edited portions clearly, noting all omissions (irrelevant, unintelligible, etc.) and placing substitutions in brackets.

A5.6.4. Correct grammar and syntax, but do not change the original meaning or intent of the statements or testimony.

A5.6.5. Begin typing each interview on a new page.

A5.7. Special Considerations for Interviewing Injured Witnesses. The techniques for interviewing witnesses injured and/or hospitalized because of their involvement in a mishap are not unlike those previously discussed for uninjured personnel. However, there are some differences. Testimony by witnesses who were injured or involved in a mishap may contain inaccuracies due to confusion or disorientation. Evaluate verbatim transcripts of such testimony; encourage witnesses to supplement their original statements if after further thought they are able to furnish additional information. Record these additions without modifying the text of the original statement. Allow witnesses complete freedom in describing events pertinent to a mishap. Avoid using leading questions or prompting the witness.

A5.7.1. Inpatients:

A5.7.1.1. The medical facility admitting and treating the injured survivors of a mishap is responsible for their well-being; interviews of injured survivors in inpatient status must be coordinated with the medical facility and attending physicians so not to conflict with the injured survivor's medical needs.

A5.7.1.2. Questions should be limited to essentials, and the number of interviewers held to a minimum. The board's medical member is logical to have present at such interviews.

A5.7.1.3. In cases where the person being interviewed is giving testimony while under the influence of medications, it is the medical member's responsibility to qualify the credibility of information obtained under these circumstances. All testimony obtained from witnesses under medication is to be identified as such.

A5.7.1.4. Two or three short interviews with certain injured survivors may be more beneficial and have less negative effect on their emotional state than one lengthy session; handle each case on the basis of its own circumstances.

A5.7.1.5. The well-being of the witness is paramount at all times and governs SIB conduct of this type interview.

A5.7.2. Outpatients:

A5.7.2.1. It is not unusual for an injured survivor of a severe or fatal mishap not to be able to initially recall details of the mishap. The cause of this condition is usually temporary and medically valid; do not interpret the inability of the witness to recall details as a lack of cooperation.

A5.7.2.2. Patience and empathy on the part of the interviewer may eventually result in obtaining the desired information, whereas persistence and impatience may not.

A5.7.2.3. Bear in mind that personnel under a physician's care may still tire easily or be subject to abrupt changes in demeanor as a result of medication or post-traumatic reaction. Respond appropriately and professionally, as you would wish to be treated under similar circumstances.

NOTE: Do not administer hypnotic techniques, truth serums, or drugs to witnesses.

Figure A5.1. Memory-Jogging Questions.

Estimate aircraft altitude (feet) and speed (knots or mph): _____

Attitude (nose up or down--use model): _____

Roll (left or right): _____

Yaw (left or right): _____

Flight path (direction, tumbling, rolling, diving, falling): _____

Fluids leaking (fuel, oil, hydraulic): _____

Sounds (engines, explosion): _____

Fire (size, color, location): _____

Smoke (amount, color, location): _____

Describe objects that fell from aircraft: _____

Did anyone eject or bail out: _____

Aircraft configuration: _____

 Gear (extended or retracted): _____

 Flaps: _____

 Leading edge (extended or retracted): _____

 Trailing edge (extended or retracted): _____

 Speed brakes/spoiler (extended or retracted): _____

 External stores (fuel tanks, ordnance): _____

Describe weather: _____

 Conditions (clear, rain, fog, sleet, snow, hail): _____

 Thunderstorms (size, distance): _____

 Wind direction: _____

 Velocity (knots or mph): _____

 Ceiling (feet): _____

 Visibility (feet or miles): _____

 Temperature (C or F): _____

 Dew point (C or F): _____

Position of survivors or bodies at crash site: _____

Items removed from crash site and by whom: _____

Other witnesses present (names, description): _____

Additional comments: _____

Attachment 6**SPOUSE/FRIEND INTERVIEW GUIDE*****Section A6A—General Information***

A6.1. Introduction. One of the most difficult tasks safety investigation board members may be called upon to perform is an interview of a family member or close friend of someone involved in a major mishap. It is doubly difficult when the person involved in the mishap did not survive or was gravely injured. However, information about lifestyle and habits is essential to building a complete picture of every mishap, even if only to rule out human performance as contributory to the overall sequence. In cases where mechanical failure largely would be ruled out or is not immediately obvious, interviews with survivors and friends dramatically increase in importance.

A6.2. General Guidelines.

A6.2.1. Use as few interviewers as possible, normally a maximum of two. Ideally, a single board member should be assigned to each individual who will be interviewed for personal information. This is usually the medical member, but may be anyone depending on the information sought and the type of rapport that may be called for to draw out the desired information to include the board president, aviation psychologist or the human factors consultant.

A6.2.2. Refresh your memory about interview techniques and procedures by referring to [Attachment 5](#).

A6.2.3. Be particularly sensitive to the personal schedule of the individual you need to interview. If they must make funeral arrangements or frequent trips to see a person involved in a mishap, work around those constraints. Do not intrude on grief unless the people you intend to interview will be unavailable later.

A6.2.4. In some highly charged situations, it may be best to have the designated interviewer introduced by the involved person's commander or a trusted friend. However, under no circumstances should the person who helps establish contact be permitted to remain for the interview unless absolutely essential for emotional support.

A6.3. Conducting the Interview.

A6.3.1. Introduce yourself and explain your role in the investigation process.

A6.3.2. Emphasize the confidential nature of the interview and information obtained during it.

A6.3.3. Use the following questions to gather information and guide discussion; take as few notes as possible if the interview is tape-recorded.

A6.3.4. Maintain a professional and caring demeanor without becoming overly emotional.

Section A6B—Interview Questions/Information Needed**A6.4. Physical Condition:**

A6.4.1. How would you describe the pilot's physical condition? (circle one)

Athletic Active Inactive Sedentary Unknown

A6.4.2. How would you describe the pilot's general lifestyle?

Athletic Active Inactive Sedentary Unknown

A6.4.3. How would you describe the pilot's physical strength? (circle one)

Very Strong Strong Average Below Average Weak Unknown

A6.5. Physical Coordination and Motor Skills:

A6.5.1. How would you describe the pilot's coordination level? (circle one)

Deft Above average Average Below average Awkward

A6.5.2. What were the pilot's general sports activities, etc.?

A6.6. Physical Fatigue:

A6.6.1. Was the pilot physically fatigued during the day of mishap flight? If yes, what caused this fatigue?

A6.7. Duty Day:

A6.7.1. How would you estimate:

A6.7.1.1. The number of hours the pilot spent in the squadron in the last 7 days?

A6.7.1.2. The number of duty hours the pilot worked in the 72 hours before mishap?

A6.7.1.3. The number of hours the pilot had planned to work the day of the mishap?

A6.7.2. Were there extra jobs or projects (on or off duty) that generated extra work?

A6.8. Sensory Information Processing:

A6.8.1. Did the pilot ever have any problem with balance, hearing, vision, taste, smell, touch, or body position sense?

A6.9. Food and Fluid Intake:

A6.9.1. How would you describe the food intake of the pilot for the 24 hours before the mishap flight?

A6.9.2. Was this characteristic of the prior 2 weeks or so?

A6.9.3. Was the pilot on a diet? If yes, what type?

A6.9.4. How would you describe the fluid intake of the pilot for the 24 hours before the mishap?

A6.10. Circadian Rhythm:

A6.10.1. Where had the pilot traveled within 7 days of the mishap flight?

A6.11. Diurnal Cycle and Sleep:

A6.11.1. How many hours did the pilot usually sleep?

A6.11.2. How would you estimate the number of hours slept:

A6.11.2.1. In the 7 days before the mishap?

A6.11.2.2. In the 72 hours before the mishap?

A6.11.2.3. In the 24 hours before the mishap?

A6.11.3. Did the mishap flight or preparation for it interrupt the pilot's usual sleep routine?

A6.11.4. Did the pilot complain of sleepiness or fatigue?

A6.12. Activity Level:

A6.12.1. What do you know about the types and level of physical and mental activity of the pilot between the last regular sleep period and the mishap?

A6.12.1.1. Physical activity:

A6.12.1.2. Mental activity:

A6.13. Leave:

A6.13.1. How long had it been (in weeks) since the pilot's last leave and how long was the leave? What was the nature of the pilot's last leave?

A6.13.2. Was it conducive to rest and relaxation?

A6.13.3. Leave companions:

A6.13.4. Leave activities:

A6.14. Tobacco Habits:

A6.14.1. What type of tobacco did the pilot use?

A6.14.2. How much tobacco did the pilot use daily?

A6.14.3. How long had the pilot used tobacco?

A6.14.4. Had the pilot's tobacco use habits changed recently?

A6.15. Alcohol Consumption:

A6.15.1. What were the pilot's normal drinking habits?

A6.15.2. How many drinks did the pilot consume within 24 hours of the mishap flight and how long prior?

A6.15.3. Had the pilot's drinking habits changed recently?

A6.16. Drug Use: Are you aware whether the pilot was taking any prescription or nonprescription medication, either before or during the mishap flight? If so, what were the drug(s) and the purpose and source for each?

A6.17. Habit Pattern Changes: Did the pilot change any of the following habit patterns recently? If so, how?

A6.17.1. Eating:

A6.17.2. Physical activity:

A6.17.3. Sleeping:

A6.17.4. Socializing:

A6.17.5. Work:

A6.17.6. Other (specify):

A6.18. Pathological Factors:

A6.18.1. Are you aware of any disease or defect the pilot may have been experiencing at the time of mishap?

A6.18.2. Had the pilot recently experienced, or had a history of, fainting spells?

A6.18.3. Had the pilot recently experienced, or had a history of, motion sickness?

A6.19. Learning and Memory: How would you describe the pilot for each of the following? (circle one with 1 being poor and 7 being excellent.)

Learning ability	1	2	3	4	5	6	7
Motivation to learn	1	2	3	4	5	6	7
Learning transfer	1	2	3	4	5	6	7
Mental flexibility	1	2	3	4	5	6	7

A6.20. Parent's History and Involvement:

A6.20.1. Did the pilot's natural parents have a history of heart disease, stroke, seizures, or diabetes?

A6.20.2. What do you believe was the pilot's relationship with his or her parents?

A6.20.3. How would you describe the kind and level of parental interest in the pilot's career and their motivation on his or her behalf?

A6.21. Personality Factors:

A6.21.1. Did you notice any personality changes in the pilot since his or her arrival with the unit? If yes, how would you describe them?

A6.21.2. Did the pilot tend to "change personalities" when flying or driving? If yes, how?

A6.22. Previous Experience. Please describe the pilot's history of involvement in pursuits which require good vision and the establishment and maintenance of situational awareness (sports, games, hobbies):

A6.23. Social Companions. With whom did the pilot most often socialize (Divide 100 points among the following to establish a rough percentage of interactions)?

A6.23.1. Family:

A6.23.2. Friends:

A6.23.3. Peers:

A6.23.4. Church:

A6.23.5. Social groups:

A6.23.6. Cultural groups:

A6.23.7. Recreational groups:

A6.24. Rules Conformance:

A6.24.1. Did the pilot tend to bend the rules? If yes, what would be his or her rationale?

A6.24.2. Were you aware of any pressures on the pilot to bend the rules to get the job done regardless of cost?

A6.25. Family Relations:

A6.25.1. Are you aware of any problems or conflicts the pilot was having with any of those close to him or her (friends, family)?

A6.25.2. Are you aware of any deaths, injuries, or illnesses in those close to the pilot that affected him or her?

A6.25.3. Are you aware of any personal problems related to changes or anticipated changes in any of the following:

A6.25.3.1. Financial status:

A6.25.3.2. Legal problems:

A6.25.3.3. Job status:

A6.25.3.4. Religious problems:

A6.25.3.5. Marital problems or status:

A6.26. Personal Motivation: Why do you believe the individual wanted to be a pilot?

A6.27. Satisfaction: What do you believe was the pilot's level of satisfaction in the following areas (circle one with 1 being poor and 7 being excellent)?

Career Choice	1	2	3	4	5	6	7
Duty Location	1	2	3	4	5	6	7
Aircraft/Assignment	1	2	3	4	5	6	7
Ground Duties	1	2	3	4	5	6	7

A6.28. Emotions and Moods:

A6.28.1. Did the pilot experience any intense emotion before the mishap flight? If yes, can you describe what caused it and how they reacted?

A6.28.2. Are you aware of the pilot's mood before the mishap flight?

A6.28.3. Did the pilot have a recent history of significant changes in moods or emotions? If yes, how would you describe the changes?

A6.29. Behavioral Factors:

A6.29.1. Did the pilot seem depressed recently? If yes, do you have any idea why?

A6.29.2. Did the pilot seem anxious recently? If yes, do you have any idea why?

A6.29.3. Was the pilot's behavior notably unusual before the mishap flight? If yes, what was out of the ordinary?

A6.30. Other Notes: What other thoughts relating to the pilot's human characteristics do you consider pertinent?

Attachment 7**GENERIC POST-MISHAP UNIT MEMBER SURVEY**

An effort to evaluate human factors in a recent flight mishap requires the investigators to have valid peer opinions from aircrew. This information will be anonymous and for safety investigation board use only. Boards may reproduce and use immediately, or tailor to fit specific investigation requirements.

Part I -- All Unit Personnel

What are your opinions of the following in this unit? (circle one with one being unfavorable and 7 being favorable)

Reliability of aircraft	1	2	3	4	5	6	7
Adequacy of aircraft systems	1	2	3	4	5	6	7
Reliability of egress systems	1	2	3	4	5	6	7
Adequacy of training	1	2	3	4	5	6	7
Adequacy of flying time	1	2	3	4	5	6	7
Adequacy of aircraft pubs	1	2	3	4	5	6	7
Fairness of scheduling	1	2	3	4	5	6	7
Adequacy of leadership	1	2	3	4	5	6	7
TDY frequency	1	2	3	4	5	6	7
TDY duration	1	2	3	4	5	6	7
Additional duties	1	2	3	4	5	6	7
Promotion system	1	2	3	4	5	6	7
OPSTEMPO	1	2	3	4	5	6	7
Training for assigned unit missions	1	2	3	4	5	6	7
Frequency of rules violations	1	2	3	4	5	6	7
General job satisfaction	1	2	3	4	5	6	7
Unit atmosphere	1	2	3	4	5	6	7
Unit professional standards	1	2	3	4	5	6	7
Career progression potential	1	2	3	4	5	6	7

Part II--Peer Assessment

(Complete only if you feel you knew the mishap pilot well; it is not necessary to have had a social relationship with him/her.)

How would you rate the pilot as an officer?

LOW 1 2 3 4 5 6 7 HIGH

How would you rate him or her as a pilot?

LOW 1 2 3 4 5 6 7 HIGH

How would you rate the pilot's flying skills relative to their peers?

LOW 1 2 3 4 5 6 7 HIGH

What is your estimate of the pilot's general leadership qualities relative to their peers?

LOW 1 2 3 4 5 6 7 HIGH

What is your assessment of the pilot's resistance to peer influence or pressure?

LOW 1 2 3 4 5 6 7 HIGH

How would you rate the pilot's situational awareness reputation relative to their peers?

LOW 1 2 3 4 5 6 7 HIGH

How would you rate the pilot's crew coordination/wingman consideration/performance relative to their peers?

LOW 1 2 3 4 5 6 7 HIGH

How would you rate the pilot's attitude toward cooperation and teamwork in general?

LOW 1 2 3 4 5 6 7 HIGH

How would you rate the pilot's flight discipline?

LOW 1 2 3 4 5 6 7 HIGH

Are you aware of any pressure on the mishap pilot or others in your unit that doesn't seem related to mission accomplishment?

Are you aware of any extra unit-related work the mishap pilot may have been involved in?

Are you aware of any extra career-related work (master's degree, service school correspondence or seminars, etc.) the mishap pilot may have been involved in?

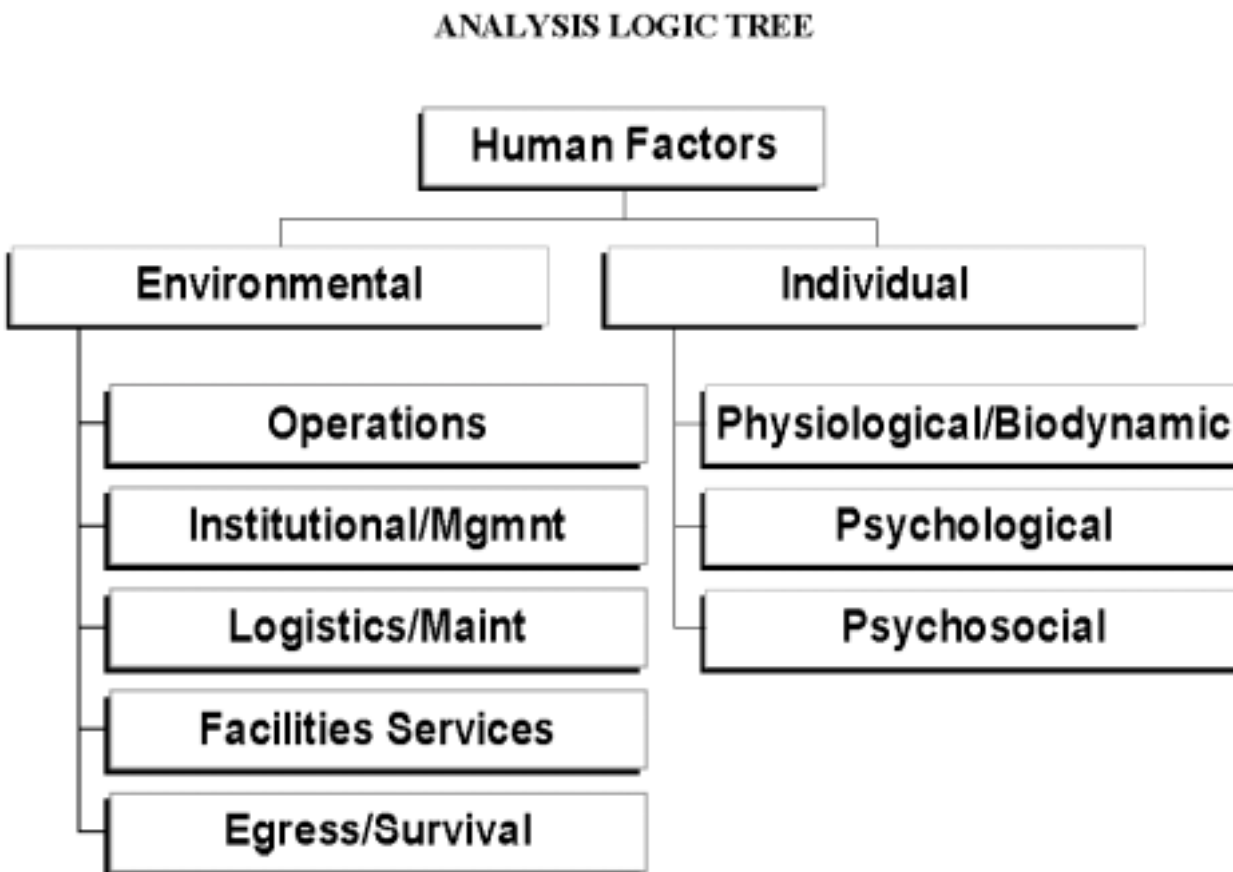
Are you aware of any non-Air Force work the mishap pilot may have been involved in after hours?

COMMENTS:

Attachment 8

HUMAN FACTORS TERMS

A8.1. Introduction. In the Life Science Report program, human factors are broken down into two categories; environmental and individual. The mishap crew, operator, or pilot react to the environment to which they're exposed. The environmental factors cover not only the physical environment to which the mishap crew members are exposed but also the organizational and personal environments. The individual factors cover physiological through psychosocial factors. The human factors analysis logic tree looks as follows:



A8.2. Human Factors References. There are a myriad of potential human factors, all of which need to be assessed for relevancy during a mishap investigation. No flight surgeon, human factors consultant or aviation psychologist can be expected to be fully familiar with all potential human factors. What follows is a listing of general human factors categories for quick reference when using the detailed listing of human factors and their definitions which immediately follows the categorical listing. Preceding each human factor is the code used to identify that factor in the Life Sciences Report program. These definitions can also be found in the Life Sciences Report program itself.

A8.2.1. Quick Find Index of General Human Factors Categories

A8.2.1.1. ENVIRONMENTALFACTORS

EA1: AIRCRAFT / COCKPIT DESIGN FACTORS - COCKPIT SEAT

EA2: AIRCRAFT / COCKPIT DESIGN FACTORS - VISIBILITY

EA3: AIRCRAFT / COCKPIT DESIGN FACTORS - INSTRUMENTATION

EA4: AIRCRAFT / COCKPIT DESIGN FACTORS - CONTROLS / SWITCHES

EA 5: AIRCRAFT / COCKPIT DESIGN FACTORS - AUTOMATION

EB 1: OPERATIONS FACTORS - PREPARATION

EB 2: OPERATIONS FACTORS - COCKPIT / CREW RESOURCE MANAGEMENT

EB3: OPERATIONS FACTORS - PROCEDURAL GUIDANCE / PUBLICATIONS

EB 4: OPERATIONS FACTORS - MISSION DEMANDS

EC1: FACILITIES AND SERVICES FACTORS - AIRCREW SUPPORT

EC2: FACILITIES AND SERVICES FACTORS - AIR TRAFFIC CONTROL

EC3: FACILITIES AND SERVICES FACTORS - AIRFIELD CAPABILITIES

ED1: LOGISTICS / MAINTENANCE PERSONNEL - LOGISTICS / MAINTENANCE PERSONNEL

ED2: LOGISTICS / MAINTENANCE PERSONNEL - LOGISTICS/MAINTENANCE QA

ED3: LOGISTICS / MAINTENANCE PERSONNEL - LOCAL WORKING CONDITIONS

ED4: LOGISTICS / MAINTENANCE PERSONNEL - LOGISTICS / MAINTENANCE MANAGEMENT

ED5: LOGISTICS / MAINTENANCE PERSONNEL - PUBLICATIONS / PROCEDURAL GUIDANCE

EE1: INSTITUTIONAL OR MANAGEMENT FACTORS - SUPERVISORY INFLUENCES

EE2: INSTITUTIONAL OR MANAGEMENT FACTORS - TRAINING ISSUES / PROGRAMS

EE3: INSTITUTIONAL OR MANAGEMENT - EVALUATION / PROMOTION / UPGRADE ISSUES

EE4: INSTITUTIONAL OR MANAGEMENT FACTORS - WORKLOAD

EE5: INSTITUTIONAL OR MANAGEMENT FACTORS - UNIT PERCEPTIONS OF EQUIPMENT

A8.2.1.2. INDIVIDUAL FACTORS

IA1: PHYSIOLOGIC OR BIODYNAMIC FACTORS - BIODYNAMIC

IA2: PHYSIOLOGIC OR BIODYNAMIC FACTORS - SENSORY AND PERCEPTUAL

IA3: PHYSIOLOGIC OR BIODYNAMIC FACTORS - PATHOPHYSIOLOGICAL

IA4: PHYSIOLOGIC OR BIODYNAMIC FACTORS - ERGONOMIC OR BIOMECHANICAL

IB1: PSYCHOLOGICAL FACTORS - PSYCHOLOGICAL FACTORS

IB2: PSYCHOLOGICAL FACTORS - ATTENTION MANAGEMENT

IB3: PSYCHOLOGICAL FACTORS - MENTAL FATIGUE

IB4: PSYCHOLOGICAL FACTORS - PROCEDURES

IB5: PSYCHOLOGICAL FACTORS - PERCEPTUAL-MOTOR

IB6: PSYCHOLOGICAL FACTORS - JUDGMENT AND DECISION MAKING

IB7: PSYCHOLOGICAL FACTORS - EMOTIONAL STATE

IB8: PSYCHOLOGICAL FACTORS - BEHAVIOR

IB9: PSYCHOLOGICAL FACTORS - PERSONALITY STYLE

IC1: PSYCHOSOCIAL FACTORS - PEER INFLUENCES

IC2: PSYCHOSOCIAL FACTORS - PERSONAL AND COMMUNITY

IC3: PSYCHOSOCIAL FACTORS - COMMUNICATION

A8.2.2. Human Factors Definitions and Codes

A8.2.2.1. ENVIRONMENTAL FACTORS:

EA1: AIRCRAFT / COCKPIT DESIGN FACTORS - COCKPIT SEAT

EA101 ACCELERATION OR DECELERATION FORCES - IMPACT is a factor when an acceleration force of less than one second is experienced by the individual while in their properly restrained and seated position in the aircraft; and the force is of sufficient intensity to cause injury which prevents or interferes with the individuals ability to function normally during or after the acceleration.

EA102 EJECTION SEAT SEQUENCING is a factor when the sequencing mode selected is inappropriate and leads to an unsafe situation; or when the normal sequencing (single mode) creates an unsafe situation.

EA103 FIXED SEAT RESTRAINT is a factor when the seat belt, crotch strap, or shoulder harnesses do not restrain the individual properly and lead to an unsafe situation.

EA104 LIMB RESTRAINT is a factor when the restraint systems for limb control do not function properly or are inadequate and lead to an unsafe situation.

EA105 SEAT COMFORT is a factor when the cockpit seat comfort as perceived by the individual leads to an unsafe situation.

EA106 SEAT DESIGN is a factor when there is an inherent defect in the design of the seat which leads to an unsafe situation.

EA2: AIRCRAFT / COCKPIT DESIGN FACTORS - VISIBILITY

EA201 CANOPY DESIGN is a factor when the canopy design limits the individual's visibility outside of the aircraft and effects safe mission completion.

EA202 CANOPY REFLECTIONS is a factor when canopy reflections limit the individual's visibility inside or outside of the aircraft and effects safe mission completion.

EA203 COCKPIT LIGHTING is a factor when cockpit lighting limits the individual's visibility outside of the aircraft and effects safe mission completion; or when the cockpit lighting is inadequate for normal visibility inside the cockpit and effects safe mission completion.

EA204 GLARE is a factor when an intense source of reflected light degrades vision and effects safe mission completion.

EA205 HEAD-UP-DISPLAY DESIGN - LOCATION is a factor when the location of the head-up-display limits the individual's visibility outside of the aircraft and effects safe mission completion.

EA206 HEAD-UP-DISPLAY DESIGN - SYMBOLOGY is a factor when the symbology used on the head-up-display limits the individual's visibility outside of the aircraft and effects safe mission completion.

EA207 VISION RESTRICTED BY EQUIPMENT STRUCTURES is a factor when structures other than the head-up-display limits the individual's visibility outside of the aircraft and effects safe mission completion.

EA3: AIRCRAFT / COCKPIT DESIGN FACTORS - INSTRUMENTATION

EA301 INSTRUMENT DESIGN is a factor when the instrumentation design is inadequate for mission demands leading to an unsafe situation.

EA302 INSTRUMENT FAILURE is a factor when the instrumentation fails leading to an unsafe situation.

EA303 INSTRUMENT LIGHTING is a factor when the instrumentation lighting is inadequate for mission demands leading to an unsafe situation.

EA304 INSTRUMENT LOCATION is a factor when the instrumentation location scheme is inadequate for mission demands leading to an unsafe situation.

EA305 FAULTY INSTRUMENT is a factor when the instrumentation supplies incorrect information to the individual leading to an unsafe situation.

EA306 INSTRUMENT SIZE is a factor when the instrumentation size is inadequate for mission demands leading to an unsafe situation.

EA307 INSTRUMENT SYMBOLOGY is a factor when the instrumentation symbology is inadequate for mission demands leading to an unsafe situation. Also when the use of one or more symbols, which make up a format to portray or define information, cause confusion or misinterpretation.

EA4: AIRCRAFT / COCKPIT DESIGN FACTORS - CONTROLS / SWITCHES

EA401 CONTROL LOCATION is a factor when the location of controls interfere with or detract from safe mission completion.

EA402 CONTROL SHAPE is a factor when the shape of controls interfere with or detract from safe mission completion.

EA403 CONTROL SIZE is a factor when the size of controls interfere with or detract from safe mission completion.

EA404 CONTROL DESIGN is a factor when the design of controls or switches interferes with or detract from safe mission completion.

EA405 CONTROL FAILURE is a factor when the failure of controls or switches interferes with or detract from safe mission completion.

EA406 CONTROL LIGHTING is a factor when the lighting of controls or switches interferes with or detract from safe mission completion.

EA407 SWITCH LOCATION is a factor when the switches location interfere with or detract from safe mission completion.

EA408 SWITCH SHAPE is a factor when the switches shape interfere with or detract from safe mission completion.

EA409 SWITCH SIZE is a factor when the switches size interfere with or detract from safe mission completion.

EA 5: AIRCRAFT / COCKPIT DESIGN FACTORS - AUTOMATION

EA501 DESIGN DEFICIENCY is a factor when the design of the equipment being used does not adequately support mission requirements.

EA502 EMPLOYMENT GUIDANCE is a factor when the written guidance or standard operating procedures taught for a piece of equipment does not meet operational mission requirements.

EA503 FAILURE STATUS INDICATOR is a factor when an indicator, light, vibration or sound, for warning of failure status does not work or is inadequate for the situation.

EA504 FUNCTIONAL DEFICIENCY is a factor when an automated piece of equipment did not function properly leading to an unsafe situation.

EA505 FUNCTIONAL DESIGN OF SYSTEM is a factor when the design of the equipment is not compatible with the functional requirements.

EA506 MANUAL BACKUP is a factor when the individual uses the manual backup procedure to an automated process and this procedure does not adequately perform or meet operational requirements.

EA507 PROGRAM LOGIC is a factor when the programmed logic for a piece of equipment does not meet operational requirements.

EA508 RELIABILITY is a factor when an automated piece of equipment is not reliable in operational environments.

EA509 SYMBOLOGY is a factor when the system generated symbology is not adequate for mission requirements.

EA510 USE POLICY is a factor when the stated or implied use of a piece of equipment is not consistent with mission requirements.

EB 1: OPERATIONS FACTORS - PREPARATION

EB101 FLIGHT PLANNING is a factor when the individual does not properly flight plan for the mission.

EB102 PRE-FLIGHT OF AIRCRAFT is a factor when the individual does not properly pre-flight the aircraft.

EB103 PREPARATION OF PERSONAL EQUIPMENT is a factor when the individual does not properly prepare personal equipment for the mission.

EB104 FLIGHT BRIEFING is a factor when a mission element that should have been briefed was not or was inadequately briefed, briefing is considered a factor. (Normal tasks, such as lowering the gear for landing, are not considered mandatory briefing items, and briefings are not considered inadequate when such tasks are not covered.)

EB105 WEATHER ANALYSIS is a factor when the individual does not properly analyze the weather for the mission.

EB106 SYSTEMS KNOWLEDGE (DASH 1) is a factor when the individual does not have the systems knowledge (DASH 1) for the mission.

EB 2: OPERATIONS FACTORS - COCKPIT / CREW RESOURCE MANAGEMENT

EB201 CREW COORDINATION is a factor when there is not a systematic division of subtasks between crew or flight members to accomplish a larger task more efficiently and this leads to a unsafe situation. Crew coordination is the most basic level of command and control.

EB202 CRM TRAINING - INITIAL FORMAL is a factor when the individual has not received initial cockpit/crew resource management (CRM) training or the CRM training was inadequate and this lack or inadequacy degraded crew performance.

EB203 CRM TRAINING - RECURRENT is a factor when the individual has not received recurrent cockpit/crew resource management (CRM) training or the CRM training was inadequate and this lack or inadequacy degraded crew performance.

EB204 LEADERSHIP (COMMANDER STYLE) is a factor when the leadership techniques used by this individual before and during this mission degraded crew performance.

EB205 RANK IMBALANCE is a factor when the differences in rank of the crew or flight caused this individual's crew performance capabilities to be degraded.

EB206 SUBORDINATE STYLE/COPILOT SYNDROME is a factor when the individual has the basic belief that other crewmembers have the situation under control and are looking out for their best interest. Implicit in the term "other crewmembers" are nonflight members, such as ATC, the command post, RAPCON, etc. Rank may at times play a role as does ineffective crew coordination based.

EB3: OPERATIONS FACTORS - PROCEDURAL GUIDANCE / PUBLICATIONS

EB301 GRAPHIC DEPICTION is a factor when the procedural guidance or publications have inadequate graphic depiction that contributed to an unsafe situation.

EB302 WRITTEN PROCEDURES - INADEQUATE is a factor when the procedural guidance or publications have inadequate written procedures that contributed to an unsafe situation.

EB303 WRITTEN PROCEDURES - INAPPROPRIATE is a factor when the procedural guidance or publications have inappropriate written procedures that contributed to an unsafe situation.

EB304 MISLEADING GUIDANCE is a factor when the procedural guidance or publications have misleading written guidance that contributed to an unsafe situation.

EB305 NOT CURRENT is a factor when the procedural guidance or publications are not current and contributed to an unsafe situation.

EB 4: OPERATIONS FACTORS - MISSION DEMANDS

EB401 ACCELERATION FORCES - IN-FLIGHT is a factor when an acceleration force of longer than one second prevents or interferes with the performance of normal crew duties.

EB402 CHANGE IN BRIEFED MISSION is a factor when the activities that occur during a flight are significantly different from the activities covered in the pre-flight briefing; and, when it is reasonable that the crew would not expect the activities (events) to occur during this mission or when the activities are briefed inflight immediately before they occur.

EB403 CREW REST is a factor when the rest required by regulation was not taken or the opportunity for crew rest was not provided.

EB404 CREW/FLIGHT MAKEUP/COMPOSITION is a factor when, in the opinion of the investigator, the makeup of the crew or of the flight should have reasonably raised obvious safety concerns in the minds of crewmembers involved in the mission, or in any other individual directly related to the scheduling of this mission.

EB405 DEPARTURE - DELAYED is a factor when a delay in the scheduled departure changes normal or briefed mission activities and results in degraded aircrew performance.

EB406 DEPARTURE - HURRIED is a factor when the departure is made earlier than scheduled due to real or perceived mission demands and the early departure changes normal or briefed mission activities and results degraded aircrew performance.

EB407 EXERCISES/EVALUATIONS is a factor when the conditions surrounding a mission generate excessive stress for the individual. These conditions are often present during deployments, checkrides, exercises, and other high-visibility missions. A mission which is subjectively perceived to be urgent or a measure of capability, such as a checkride, an ORI, a higher headquarters exercise, or Red Flag. (See perception, intellectual.)

EB408 INTERNALIZED UNIT/ORGANIZATIONAL VALUES is a factor when explicit / implicit actions or statements by unit leadership set unit / organizational values (culture) that allow an environment where unsafe mission demands or pressures exist.

EB409 LIGHTING OF OTHER AIRCRAFT is a factor when the absence, pattern, intensity or location of the lighting of other aircraft prevents or interferes with safe mission accomplishment.

EB410 AIRCRAFT PRESSURIZATION is a factor when the mission requires flying unpressurized, or at a pressure below the normal capabilities of the aircraft, and in that environment the individual is not able to perform their duties normally due to the affects of low pressure.

EB411 TEMPORARY DUTY MISSIONS is a factor when the individuals temporary duty schedule is taxing their ability to cope with normal mission demands.

EB412 RULES CONFORMANCE is a factor when the individuals efforts to follow or conform to the rules dictated by the mission conflict with an obvious alternative course of action that would have been safer.

EB413 TIME INTO CREW DUTY DAY is a factor when the mission demands are determined, by the investigator, to exceed those normally required or to exceed the criteria that was used to define the stated crew duty day.

EB414 UNIT MISSION DEMANDS is a factor when the unit mission demands exceed those necessary to complete the stated mission or are significantly above those required by other units with similar missions.

EB415 VISION RESTRICTED BY ICING/WINDOWS FOGGED/ETC. is a factor when it is determined by the investigator that icing or fogging of the windscreen restricted the vision of the individual to a point where normal crew duties were affected.

EB416 VISION RESTRICTED BY WEATHER/HAZE/DARKNESS is a factor when it is determined by the investigator that weather, haze, or darkness restricted the vision of the individual to a point where normal crew duties were affected.

EB417 VISION RESTRICTED IN AIRCRAFT BY DUST/SMOKE/ETC. is a factor when it is determined by the investigator that dust, smoke, etc. restricted the vision of the individual to a point where normal crew duties were affected.

EB418 WEATHER - OTHER THAN VISIBILITY RESTRICTION is a factor when the individual is not able to complete normal mission requirements safely due to weather induced task saturation / distraction / etc.

EC1: FACILITIES AND SERVICES FACTORS - AIRCREW SUPPORT

EC101 DINING FACILITIES/ACCESS is a factor when the individual would have used the dining facilities had access not been denied for a reason other than the individual's choice. (closed, distance, transportation, etc.)

EC102 EXERCISE FACILITIES/ACCESS is a factor when the individual would have used exercise facilities had access not been denied for a reason other than the individual's choice. (closed, distance, transportation, etc.)

EC103 RECREATION OR LEAVE is a factor when the individual would have taken leave or done a recreational activity had access not been denied for a reason other than the individual's choice.

EC104 CREW REST QUARTERS is a factor when quarters are inadequate to support mission demands.

EC105 DUTY LOCATION SATISFACTION is a factor when the individual is noticeably unsatisfied with the duty location causing degraded crew performance.

EC106 MEDICAL CARE is a factor when medical care is inadequate to support mission demands.

EC107 RESIDENCE QUARTERS is a factor when the individual's residence is inadequate and degrades crew performance.

EC108 TRANSIENT MAINTENANCE is a factor when transient maintenance is inadequate to support mission demands.

EC2: FACILITIES AND SERVICES FACTORS - AIR TRAFFIC CONTROL

EC201 GUIDANCE - INACCURATE is a factor when the guidance available to air traffic control is inaccurate and leads to an unsafe situation.

EC202 GUIDANCE - INAPPROPRIATE is a factor when the guidance available to air traffic control is inappropriate and leads to an unsafe situation.

EC203 MONITORING is a factor when there is inadequate monitoring of airspace by air traffic control.

EC204 NAV-AIDS/ENROUTE is a factor when there is a lack of navigation-aids to provide course guidance enroute.

EC205 LANGUAGE BARRIER is a factor when the individual is unable to understand air traffic control instructions due to the language being spoken by the controller.

EC3: FACILITIES AND SERVICES FACTORS - AIRFIELD CAPABILITIES

EC301 MONITORING is a factor when runway supervisory units are not available to determine safe landing configuration and / or a supervisor of flight (SOF) is not available.

EC302 NAV-AIDS/RADAR is a factor when the terminal ATC facility lacks radar and nonradar capabilities to provide approach control services to aircraft arriving, departing, or transiting airspace controlled by the facility.

EC303 RUNWAY DIMENSIONS is a factor when the dimensions of the runway does not meet those required by the aircraft for safe operations.

EC304 RUNWAY LIGHTING is a factor when the lighting of the runway does not meet requirements for safe operations.

EC305 RUNWAY SLOPE is a factor when the slope of the runway does not meet requirements for safe operations of mishap aircraft.

EC306 SURROUNDING ENVIRONMENT is a factor when the surrounding environment of the runway does not meet requirements for safe operations.

ED1: LOGISTICS / MAINTENANCE PERSONNEL - LOGISTICS / MAINTENANCE PERSONNEL

ED101 LOG/MAINT - COMMAND GUIDANCE is a factor when the command guidance given to logistics and maintenance personnel is inadequate to support mission demands.

ED102 LOG/MAINT - DESIGN is a factor when logistics and maintenance personnel inadequately support the mission due to equipment design.

ED103 LOG/MAINT - INSPECTION is a factor when logistics and maintenance personnel inadequately inspect support equipment leading to an unsafe situation.

ED104 LOG/MAINT - INSPECTION POLICY is a factor when logistics and maintenance personnel are given inadequate inspection policy causing an unsafe situation.

ED105 LOG/MAINT - PROCEDURES is a factor when logistics and maintenance personnel are following inadequate procedures causing an unsafe situation.

ED106 LOG/MAINT - SUPERVISION is a factor when logistics and maintenance personnel are provided inadequate supervision causing an unsafe situation.

ED2: LOGISTICS / MAINTENANCE PERSONNEL - LOGISTICS/MAINTENANCE QA

ED201 LOG/MAINT QA - INSPECTION is a factor when logistics and maintenance quality assurance personnel inadequately inspect support equipment leading to an unsafe situation.

ED202 LOG/MAINT QA - INSPECTION POLICY is a factor when logistics and maintenance quality assurance personnel are following inadequate inspection policy causing an unsafe situation.

ED203 LOG/MAINT QA - PROCEDURES is a factor when logistics and maintenance quality assurance personnel are following inadequate procedures causing an unsafe situation.

ED204 LOG/MAINT QA - SUPERVISION is a factor when logistics and maintenance quality assurance personnel are provided inadequate supervision causing an unsafe situation.

ED3: LOGISTICS / MAINTENANCE PERSONNEL - LOCAL WORKING CONDITIONS

ED301 LOCAL - MANNING is a factor when manning is insufficient to support mission demands.

ED302 LOCAL - PERSONNEL HARMONY is a factor when the overall interaction of personnel associated with this mission creates an environment that leads to an unsafe situation.

ED303 LOCAL - PHYSICAL PLANT is a factor when the physical environment (buildings, structures, space) does not support mission demands.

ED304 LOCAL - SUPERVISION is a factor when supervision does not support mission demands.

ED305 LOCAL - TRAINING is a factor when training of equipment support personnel does not support mission demands.

ED4: LOGISTICS / MAINTENANCE PERSONNEL - LOGISTICS / MAINTENANCE MANAGEMENT

ED401 LOG/MAINT - ACQUISITION POLICIES is a factor when policy results in the failure to appropriately acquire an item or system that would maintain mission safety.

ED402 LOG/MAINT - ATTRITION POLICIES is a factor when inventory is allowed to lapse without replacement resulting in an unsafe condition.

ED403 LOG/MAINT - MODIFICATION POLICIES is a factor when policy results in the failure to accomplish a system modification necessary to maintain mission safety.

ED404 LOG/MAINT - OVERHAUL POLICIES is a factor when policy results in failure of system or item overhaul necessary to maintain mission safety.

ED5: LOGISTICS / MAINTENANCE PERSONNEL - PUBLICATIONS / PROCEDURAL GUIDANCE

ED501 GRAPHIC DEPICTION is a factor when graphical depictions in publications and procedural guidance are inadequate.

ED502 TECHNICAL DATA is a factor when maintenance or design technical data are clearly deficient resulting in a reduction crew performance. A lack of description of generally known procedures (such as buttoning up panels when through or using left rudder if the aircraft drifts right on landing) is not considered an inadequacy.

ED503 WRITTEN PROCEDURES is a factor when written procedural guidance or publications are clearly deficient. A lack of description of generally known procedures (such as buttoning up panels when through or using left rudder if the aircraft drifts right on landing) is not considered an inadequacy.

ED504 REGULATIONS is a factor when Air Force Instructions or regulations are clearly deficient or misleading. A lack of description of generally known procedures (such as buttoning up panels when through or using left rudder if the aircraft drifts right on landing) is not considered an inadequacy.

ED505 NOT CURRENT is a factor when publications or procedural guidance are not current. A lack of description of generally known procedures (such as buttoning up panels when through or using left rudder if the aircraft drifts right on landing) is not considered an inadequacy.

**EE1: INSTITUTIONAL OR MANAGEMENT FACTORS -
SUPERVISORY INFLUENCES**

EE101 SUPERVISION - AVAILABILITY is a factor when supervision is not available at a time critical to safe mission completion.

EE102 SUPERVISION - COMMAND AND CONTROL is a factor when "command and control" is causally related to the mishap.

EE103 SUPERVISION - COMPETENCY is a factor when the quality or adequacy of supervision was insufficient to maintain mission safety.

EE104 SUPERVISION - DEFACTO-POLICY is a factor when policy perceived and followed by the individual, which has not been established by the properly constituted authority, leads to an unsafe situation.

EE105 SUPERVISION - DISCIPLINE ENFORCEMENT is a factor when unit (organizational) and flight rules have not been enforced by the normally constituted authority.

EE106 SUPERVISION - INADEQUATE is a factor when supervision was available but not sufficient in quality, quantity, competency or timeliness.

EE107 SUPERVISION - LACK OF FEEDBACK is a factor when information critical to a potential safety issue had been provided to supervisory or management personnel without feedback to the source (failure to close the loop).

EE108 SUPERVISION - MODELING (IMITATIVE LEARNING) is a factor when the individual's learning is influenced by the behavior of peers and supervisors and when that learning manifests itself in actions that are either inappropriate to the individual's skill level or violate standard procedures and lead to an unsafe situation. (See learning, memory.)

EE109 ORDERED/LED ON FLIGHT BEYOND CAPABILITY is a factor when supervisor / management directed personnel to undertake a mission recognized as likely to fail.

EE110 SUPERVISION - PERSONALITY CONFLICT is a factor when a supervisor and aircrew member experience a "personality conflict" that leads to a dangerous error in judgment / action.

EE111 SUPERVISION - SENSITIVE TO PRESSURE is a factor when a decision to launch a potentially dangerous mission, or the manner in which a mission or sortie is conducted, is influenced by pressure from higher authority, peers or both.

EE112 SUPERVISORY PRESSURES is a factor when motivating factors stemming from a person's need to meet perceived supervisory expectations, whether or not those expectations are overtly expressed cause an unsafe situation.

**EE2: INSTITUTIONAL OR MANAGEMENT FACTORS -
TRAINING ISSUES / PROGRAMS**

EE201 FLIR (SYSTEMS) TRAINING is a factor when the individual's FLIR (forward looking infrared) training is inadequate for mission demands.

EE202 FORMATION TRAINING is a factor when the individual's formation training is inadequate for mission demands.

EE203 INSTRUMENT TRAINING is a factor when the individual is not instrument trained or is judged inadequately instrument trained to perform the mission element being attempted.

EE204 INSTRUMENT REFRESHER COURSE is a factor when the individual's instrument refresher training is inadequate for mission demands.

EE205 LIFE SUPPORT/PERSONAL EQUIPMENT TRAINING is a factor when the individual's life support or personal equipment training is inadequate for mission demands.

EE206 LOST WINGMAN TRAINING is a factor when the individual's lost wingman training is inadequate for mission demands.

EE207 LOW LEVEL TRAINING is a factor when the individual's low level training is inadequate for mission demands.

EE208 NIGHT TRAINING is a factor when the individual's night operations training is inadequate for mission demands.

EE209 NIGHT VISION DEVICES TRAINING is a factor when the individual's night vision devices training is inadequate for mission demands.

EE210 NO TRAINING FOR TASK ATTEMPTED is a factor when the individual is not trained or is judged inadequately trained to perform the mission element being attempted.

EE211 PHYSIOLOGICAL/CENTRIFUGE/SDO TRAINING is a factor when the individual's physiological, centrifuge, spatial disorientation training is inadequate for mission demands.

EE212 PROCEDURES/CHECKLIST DISCIPLINE is a factor when the individual's training in procedures and checklist discipline are inadequate for mission demands.

EE213 RADAR TRAIL DEPARTURE/RECOVERY TRAINING is a factor when the individual's training in radar trail departure and recovery are inadequate for mission demands.

EE214 SIMULATOR/PTT/CPT TRAINING is a factor when the individual's simulator training program has deficiencies that caused this individual to inappropriately react and lead to an unsafe situation.

EE215 WEAPONS EMPLOYMENT/RANGE TRAINING is a factor when the individual's training in weapons employment and the range are inadequate for mission demands.

EE3: INSTITUTIONAL OR MANAGEMENT - EVALUATION / PROMOTION / UPGRADE ISSUES

EE301 PERCEIVED PRESSURE FROM FLIGHT LEAD is a factor when the individual perceives excessive pressure to perform well due to actions of the flight lead.

EE302 PERCEIVED PRESSURE FROM INSTRUCTOR/EXAMINER is a factor when the individual perceives excessive pressure to perform well due to actions of the instructor / examiner.

EE303 PERCEIVED PRESSURE FROM MISSION COMMANDER is a factor when the individual perceives excessive pressure to perform well due to actions of the mission commander.

EE304 PERCEIVED PERFORMANCE WOULD AFFECT OES/EPR is a factor when the individual perceives that their performance on this mission will affect their next OES or EPR.

EE305 PERCEIVED PRESSURE FROM RANGE OFFICER is a factor when the individual perceives excessive pressure to perform well due to actions of the range officer.

EE306 PERCEIVED PRESSURE FROM RUNWAY SUPERVISOR is a factor when the individual perceives excessive pressure to perform well due to actions of the runway supervisory officer.

EE307 PERCEIVED PRESSURE FROM SUPERVISOR OF FLYING is a factor when the individual perceives excessive pressure to perform well due to actions of the supervisor of flying.

EE308 PERCEIVED UPGRADE PRESSURES is a factor when the individual perceives excessive pressure to perform well due to overall upgrade pressures.

EE4: INSTITUTIONAL OR MANAGEMENT FACTORS - WORKLOAD

EE401 ADDITIONAL DUTIES is a factor when the individual's additional duties interfere with or degrade crew performance.

EE402 OTHER ACADEMIC ENROLLMENT is a factor when the individual participation in educational activities not associated with active duty requirements interfere with or degrade crew performance.

EE403 PROFESSIONAL MILITARY EDUCATION is a factor when the individual's participation in professional military education interfere with or degrade crew performance.

EE404 SUPERVISOR TASKING is a factor when the individual's supervisor has clearly over tasked the individual and therefore degraded their ability to perform normal crew activities.

EE5: INSTITUTIONAL OR MANAGEMENT FACTORS - UNIT PERCEPTIONS OF EQUIPMENT

EE501 CONFIDENCE IN AIRCRAFT is a factor when the individual has indicated, in some way (verbal, actions, etc.), an obvious over or under confidence in the capabilities of the aircraft.

EE502 CONFIDENCE IN EQUIPMENT is a factor when the individual has indicated, in some way (verbal, actions, etc.), an obvious over or under confidence in the capabilities of support equipment.

EE503 CONFIDENCE IN ESCAPE SYSTEMS is a factor when the individual has indicated, in some way (verbal, actions, etc.), an obvious over or under confidence in the capabilities of the aircraft escape systems.

EE504 UNIT CHANGING MISSION/AIRCRAFT is a factor when the individual has indicated, in some way (verbal, actions, etc.), an obvious reservation or concern in their ability to adapt to the unit's changing mission/aircraft.

EE505 UNIT PLANNING TO DEACTIVATE is a factor when the individual has indicated, in some way (verbal, actions, etc.), an obvious reservation or concern in their ability to adapt to the unit's deactivation.

A8.2.2.2. INDIVIDUAL FACTORS:

IA1: PHYSIOLOGIC OR BIODYNAMIC FACTORS - BIODYNAMIC

IA101 ABDOMINAL GAS is a factor when the individual has unrelieved expansion of gases in the stomach or intestines that degrades crew performance.

IA102 ALTERNOBARIC VERTIGO is a factor when the individual experiences a sudden pressure change within the middle ear that causes an intense and unexpected vertigo that is accompanied by blurring of vision and apparent movement of the visual scene leading to a unsafe situation. [Alternobaric (pressure) vertigo can occur on ascent when an ear clears (equilibrates) suddenly or on descent during a voluntary valsalva maneuver. The vertigo normally last 10-15 seconds but can last up to several minutes in some individuals. The illusory plane and sensations vary between individuals but are consistent and repeatable in any one individual.]

IA103 BARODONTALGIA is a factor when the individual has unrelieved expansion of gases beneath fillings and in periapical abscesses in the teeth degrading crew performance.

IA104 BENDS/DECOMPRESSION SICKNESS is a factor when the individual has manifestations of mild to severe pain, usually in the larger joints, due to nitrogen evolving from the blood which causes degraded crew performance.

IA105 CHOKES/DECOMPRESSION SICKNESS is a factor when the individual has deep and sharp pain centrally located under the sternum caused by nitrogen evolving from the blood and locating in the smaller blood vessels of the lungs leading to degraded crew performance. [Chokes can cause a dry, nonproductive cough, a feeling of suffocation or the physical inability to take a normal breath.]

IA106 CNS/DECOMPRESSION SICKNESS is a factor when the individual exhibits the effects of nitrogen evolving from the blood and locating in the brain or spinal cord resulting in degraded crew performance. [Symptoms may include blurred vision, blind spots, flickering lights, headaches, or unilateral numbness or tingling.]

IA107 EAR BLOCK is a factor when the individual has unequal gas pressure of between the middle ear and the atmosphere leading to degraded crew performance.

IA108 G-INDUCED LOSS OF CONSCIOUSNESS is a factor when the individual experiences G-induced loss of consciousness (GLOC). [Usually from +Gz exposure for approximately five seconds or longer.]

IA109 G-INDUCED VISION DEFICIT is a factor when G forces experienced cause the individuals vision to be degraded to the point where normal crew duties are impaired. This visual degradation is usually categorized as "grayout" or "blackout".

IA110 HYPERVENTILATION is a factor when the effects of ventilating above the physiological demands of the body causes the individual's performance capabilities to be degraded.

IA111 HYPOXIA is a factor when the individual has insufficient oxygen supply to the body. The retina and brain are most sensitive to oxygen, and when hypoxic, grayout / blackout and loss of consciousness can occur.

IA112 PNEUMOTHORAX is a factor when the resultant collapse of the lung(s) degrades normal performance capabilities or causes incapacitation of the individual.

IA113 SINUS BLOCK is a factor when unequal gas pressure between the individual's sinus cavities and the atmosphere causes degraded crew performance.

IA2: PHYSIOLOGIC OR BIODYNAMIC FACTORS - SENSORY AND PERCEPTUAL

IA201 AUDITORY CUES is a factor when the auditory inputs are correctly interpreted but are misleading or disorienting. Also when the inputs are incorrectly interpreted and cause an impairment of normal performance.

IA202 GEOGRAPHIC DISORIENTATION is a factor when the individual experiences the type of disorientation in which he is correctly oriented with reference to the pitch, roll, and yaw axis (position in space) but not oriented in relation to known ground references or navigational fixes. (Lost, not spatially disoriented.)

IA203 ILLUSION KINESTHETIC is a factor when the individual has an erroneous perception of somatosensory stimuli of the ligaments, muscles, or joints of the body (proprioceptive) leading to degraded crew performance. [If this illusion leads to spatial disorientation you must mark and rate either IA209, IA210, or IA211.]

IA204 ILLUSION VESTIBULAR is a factor when the individual has an erroneous perception of orienting stimuli due to the semicircular ducts or otolith organs of the vestibular apparatus. [If this illusion leads to spatial disorientation you must mark and rate either IA209, IA210, or IA211.]

IA205 ILLUSION VISUAL is a factor when the individual has an erroneous perception of visual stimuli. [If this illusion leads to spatial disorientation you must mark and rate either IA209, IA210, or IA211.]

IA206 MISPERCEPTION OF DISTANCE/ALTITUDE/SEPARATION is a factor when the individual fails to detect or correctly interpret cues for distance or altitude due to an inappropriate perceptual set. [Perceptual Set - A cognitive or attitudinal framework in which a person expects to perceive certain environmental cues and tends selectively to search for those cues more actively than others. One extreme of this anomaly is when the expectancy is so strong that he or she perceives cues that in fact are not there; the other extreme is when he or she does not expect cues to the extent that he or she does not detect cues that are there. Perceptual distortions in the form of illusions may also result.]

IA207 MISPERCEPTION OF SPEED/CLOSURE RATE is a factor when the individual fails to detect or correctly interpret cues for speed or closure rate due to an inappropriate perceptual set. [Perceptual Set - A cognitive or attitudinal framework in which a person expects to perceive certain environmental cues and tends selectively to search for those cues more actively than others. One extreme of this anomaly is when the expectancy is so

strong that he or she perceives cues that in fact are not there; the other extreme is when he or she does not expect cues that are there. Perceptual distortions in the form of illusions may also result.]

IA208 NOISE INTERFERENCE is a factor when any sound not directly related to information needed for mission accomplishment interferes with the individual's ability to perform that mission.

IA209 SPATIAL DISORIENTATION (TYPE 1) UNRECOGNIZED is a factor when the individual does not receive sensory stimulation sufficient enough to make him aware of a difference between the actual and the perceived flight path of the aircraft with respect to the earth's surface.

IA210 SPATIAL DISORIENTATION (TYPE 2) RECOGNIZED is a factor when the sensory and perceptual cues available to the individual are in conflict with one another, or in conflict with the individual expectations of their orientation in space, and the intensity of that conflict causes a conscientious awareness in the individual.

IA211 SPATIAL DISORIENTATION (TYPE 3) UNCONTROLLABLE is a factor when the individual is unable to make flight control inputs that are appropriate to controlled aircraft recovery with respect to the earth's surface. Normally associated with rapidly spinning or tumbling aircraft which cause excessive stimulation of the inner ear resulting in loss of orientation in space.

PHYSIOLOGIC OR BIODYNAMIC FACTORS - SENSORY AND PERCEPTUAL

IA212 VIBRATION is a factor when the intensity of the vibration is sufficient to cause impairment of vision or adversely effect the perception of orientation.

IA213 VISION DEFICIT is a factor when the visual capabilities of the individual are below what is needed or expected to safely complete the mission. Also, when the individual's spectacles or any other visual equipment used by the individual degraded expected crew performance.

IA214 VISUAL ACQUISITION is a factor when the individual's capabilities for visually acquiring an object are below that necessary to complete the mission safely.

IA3: PHYSIOLOGIC OR BIODYNAMIC FACTORS - PATHOPHYSIOLOGICAL

IA301 ACUTE ILLNESS - OTHER is a factor when the individual has any acute illness interfering with flight duties (e.g. appendicitis).

IA302 ALCOHOL is a factor when the individual's alcohol consumption results in degraded performance.

IA303 CAFFEINE is a factor when the amount of caffeine consumed prior to flight or during flight causes a degradation in the individual's ability to complete normal crew duties. Also, when the amount of caffeine consumed results in the individual not obtaining required crew rest or results in the degradation of the quality of crew rest.

IA304 CARBON MONOXIDE POISONING is a factor when the percent saturation of CO in the blood interferes with oxygen carrying capacity of blood to the point where normal crew activities are affected.

IA305 DEHYDRATION is a factor when the fluid balance of the individual is not adequate to maintain normal physiologic function and the accomplishment of normal crew duties.

IA306 DRUGS PRESCRIBED BY MEDICAL OFFICER is a factor when the individual uses a prescribed drug with measurable effect interfering with performance.

IA307 DRUGS - OTHER is a factor when the individual takes any drug, other than prescribed, that interferes with performance. This includes any chemical compound taken for purposes of prevention of disease, treatment of disease, weight management, mood alteration, birth control or sleep management. The effects may be direct or residual, and may reduce performance capability. [Self-Medication]

IA308 FOOD POISONING is a factor when the individual manifests an illness in response to eating contaminated or infected food that interferes with normal crew duties. Food poisoning is usually characterized by nausea, vomiting, fever, abdominal pain, diarrhea, or headache.

IA309 MOTION SICKNESS is a factor when the symptoms of motion sickness impair normal crew performance. Motion sickness symptoms include nausea, sweating, flushing, vertigo, headache, stomach awareness, and vomiting.

IA310 NICOTINE is a factor when the drug nicotine, usually obtained by smoking tobacco, is at a level in the individual that is inconsistent with normal physiological function.

IA311 NUTRITION is a factor when the individual's nutritional state is inadequate to fuel the brain and body functions resulting in degraded crew performance.

IA312 PHYSICAL FATIGUE is a factor when the individual's diminished physical capability due to overuse (time/load) degrade crew performance. [The effects of prolonged physical activity, or the effects of brief but extreme physical activity, either of which taxes a person's physical strength to the level of exhaustion.]

IA313 PHYSICAL FITNESS is a factor when the relative physical state of the individual, in terms of a regular rigorous exercise program or a physically active lifestyle, is not adequate to support mission demands.

IA314 PRE-EXISTING DISEASE/DEFECT is a factor when the individual has pre-existing diseases or defects that caused degraded crew performance. [These should be identified in Section III (2) of this Life Sciences Mishap Report]

IA315 RADIATION is a factor when an individual is exposed to radiation particles to a level that cause an impairment of normal function.

IA316 SIDE EFFECTS/HANGOVER is a factor when the individual has symptoms caused by use of drugs or alcohol interfering with flight duties.

IA317 SUDDEN INCAPACITATION/UNCONSCIOUSNESS is a factor when the individual has an abrupt loss of functional capacity / conscious awareness. [NOT GLOC]

IA318 THERMAL STRESS - COLD is a factor when the individual is exposed to cold resulting in compromised function.

IA319 THERMAL STRESS - HEAT is a factor when the individual is exposed to heat resulting in compromised function.

IA320 TOXIC EXPOSURE - OTHER is a factor when the individual is exposed to an agent that compromises function (e.g. hydrazine).

IA321 WAIVERS - MEDICAL is a factor when the individual is flying under a medical waiver and that condition that was waived directly or indirectly degraded the individual's ability to perform normal crew duties.

IA322 WINDBLAST is a factor when the individual's ability to perform normal crew duties is degraded during or after exposure a wind blast situation.

IA4: PHYSIOLOGIC OR BIODYNAMIC FACTORS - ERGONOMIC OR BIOMECHANICAL

IA401 BODY SIZE is a factor when the individual's anthropometric characteristics degraded or interfered with normal crew duties.

IA402 BODY/HEAD SITUATION is a factor when the body or head are voluntarily or involuntarily placed in a position that degrades or interferes with normal crew duties.

IA403 DEXTERITY is a factor when the individual's dexterity is below that required for mission demands.

IA404 INADVERTENT OPERATION - MECHANICALLY INDUCED is a factor when individual's movements inadvertent activate or deactivate equipment controls that adversely affect safe mission completion.

IA405 PERSONAL EQUIPMENT INTERFERENCE is a factor when the individual's personal equipment interferes with normal crew duties and safety.

IA406 PHYSICAL MOBILITY is a factor when the individuals physical mobility limits their ability to perform normal crew duties.

IA407 PHYSICAL STRENGTH is a factor when the individual is not capable of attaining the physical strength necessary for mission demands. [In the absence of objective measurement, this may be a subjective judgment of peers as to the relative physical strength of a person.]

IA408 WORKSPACE INCOMPATIBLE WITH HUMAN is a factor when the workspace is incompatible with the mission requirements and mission safety for this individual.

IB1: PSYCHOLOGICAL FACTORS - PSYCHOLOGICAL FACTORS

IB101 EVENT CURRENCY is a factor when the crewmember has not met the training requirement for a specific event (e.g. single engine flame out landing) and is non-current for the event (maneuver).

IB102 EVENT PROFICIENCY is a factor when the individual has (1) never done specific event before, (2) done it before but not recently, or (3) done it recently but for the first time, and this lack of proficiency leads to an unsafe situation. ["Proficiency" and "currency" as defined by MAJCOM criteria are not necessarily synonymous, as the pilot's demonstrated ability to perform the task is the governing factor.]

IB103 INADEQUATE TRANSITION is a factor when the individual changes primary weapon system and there is insufficient time for the individual to learn / experience the new system.

IB104 JOB/FLYING CURRENCY is a factor when the individual has not met the general training requirements for his job / weapon system and is considered "non-current".

IB105 JOB/FLYING PROFICIENCY is a factor when an evaluator determines that the individual is not proficient as determined by performance and training records.

IB106 LEARNING ABILITY - RATE is a factor when the individual's relative efficiency with which new information is acquired, and relatively permanent adjustments made in behavior or thinking, are not consistent with mission demands.

IB107 LIMITED RECENT EXPERIENCE is a factor when the individual's experience for either a specific maneuver, event or scenario is not sufficiently current to permit safe mission execution.

IB108 LIMITED TOTAL EXPERIENCE is a factor when a individual has performed a maneuver, or participated in a specific scenario, infrequently or rarely.

IB109 MEMORY ABILITY/LAPSES is a factor when the individual is unable or has lapses in the ability to recall past experience needed for safe mission completion. [Experience includes any information a person receives through any means, any cognitive func-

tions he or she performed on that information, and any response he or she made as a result of it.]

IB110 NEGATIVE TRANSFER is a factor when the individual uses an inappropriate response that was learned in a different system (e.g. aircraft, tower, etc.); a form of habit pattern interference.

IB111 TECHNICAL/PROCEDURAL KNOWLEDGE is a factor when a pilot was adequately exposed to the information needed to perform the mission element but did not absorb it, lack of knowledge is considered a factor. Lack of knowledge implies no deficiency in the training program, but rather the failure of the pilot to absorb or retain the information. (Exposure to information at a point in the past does not imply "knowledge" of it.) Knowledge of the capabilities and limitations of the weapon system, and the tactics used to employ it in various environmental conditions that has been acquired through formal training.

IB2: PSYCHOLOGICAL FACTORS - ATTENTION MANAGEMENT

IB201 BOREDOM is a factor when the individual demonstrates a state of reduced conscious attention due to a sense of security, self-confidence, or a perceived absence of threat from the environment. This may often be a result of highly repetitive tasks. Failure to recognize (process) information provided by both the external and cockpit (instruments) environment. Lack of a state of alertness or readiness to process immediately available information.

IB202 CHANNELIZED ATTENTION is a factor when the individual is focusing conscious attention on a limited number of environmental cues to the exclusion of others of subjectively equal, higher, or more immediate priority leading to an unsafe situation. [Channelized attention is an active anomaly of attention sometimes referred to as fixation. (Focus of attention = span of attention). A limited focus of awareness leading to the exclusion of comprehensive information; loss of a global orientation (e.g. target fixation, preoccupation with location of wingman).]

IB203 COGNITIVE TASK OVERSATURATION is a factor when the individual has an attention anomaly in which the quantity of information to process exceeds a person's cognitive or mental resources, resulting in loss of situational awareness. An overload of the perceptual apparatus due to multiple stimuli with a resultant failure in taking effective action.

IB204 CONFUSION is a factor when the individual has a loss of situational awareness that is recognized by the individual but results in a state characterized by bewilderment, emotional disturbance, lack of clear thinking, and (sometimes) perceptual disorientation. A failure in maintaining a cohesive and orderly awareness of events and required actions.

IB205 DISTRACTION is a factor when the individual has an interruption and redirection of the focus of attention by an environmental cue or mental process that degrades crew performance. [Interference with a primary stimulus by a secondary, less critical factor (ignoring instruments when watching weather.)]

IB206 FASCINATION is a factor when the individual has an anomaly of attention in which they observe the environmental cues around them but fail to respond to the cues (as if he or she were viewing them from the outside) leading to an unsafe situation. [Fascination is usually associated with a high-stress or crisis situation. Intense focus (similar to channelized attention) with a persistent and pleasurable association. Less goal directed than channelized attention.]

IB207 HABIT INTERFERENCE is a factor when the individual reverts to previously learned response modes which are objectively inappropriate to the task at hand. [Habit pattern interference usually occurs at the preconscious level of awareness. The impedance of an action or series of actions required through regression to an earlier learned behavior not appropriate to the current situation (confusing a fuel turn off switch with an ordnance de-arm switch - location cued).]

IB208 INATTENTION is a factor when the individual has a state of reduced conscious attention due to a sense of security, self-confidence, or a perceived absence of threat from the environment which degrades crew performance. [This may often be a result of highly repetitive tasks. Failure to recognize (process) information provided by both the external and cockpit (instruments) environment. Lack of a state of alertness or readiness to process immediately available information.]

IB209 SELECTIVE INATTENTION is a factor when the individual pays insufficient attention to relevant environment cues due to lack of knowledge or an inappropriate perceptual or response set. [(The opposite of channelized attention.) The intention failure to register or process information (e.g. fuel warning light on F-16 HUD requiring a follow-on screen for specific diagnosis).]

IB210 TEMPORAL DISTORTION is a factor when the individual experiences a compression or expansion of time relative to reality leading to an unsafe situation. [Unusually associated with a "fight or flight" response.]

IB3: PSYCHOLOGICAL FACTORS - MENTAL FATIGUE

IB301 ACUTE is a factor when the individual has the type of exhaustion associated with physical or mental activity between two regular sleep periods which degrade crew performance. [Acute or transient performance decrement is eliminated after a regular sleep period.]

IB302 CHRONIC is a factor when the individual has the type of exhaustion resulting from an inadequate recovery from successive periods of acute or transient fatigue which degrade crew performance. [One regular sleep period will not eliminate cumulative fatigue; however, several sleep periods and reduced interim activity will eliminate it.]

IB303 CIRCADIAN RHYTHM DESYNCHRONY is a factor when the individual is in a state in which the body's "normal" 24-hour rhythmic biological cycle (circadian rhythm) is disturbed; typically caused by movement across several time zones and generally having an adverse effect upon pilot performance. Colloquially referred to as "Jet Lag."

IB304 MOTIVATIONAL EXHAUSTION (BURNOUT) is a factor when the individual has the type of exhaustion associated with the wearing effects of such psychosocial problems as unresolved conflicts, prolonged frustration, or constant worrying which leads to degraded crew performance. [It is not eliminated by any number of sleep periods without first resolving the conflict or removing the frustrations. (Also called subjective fatigue or burnout.)]

IB305 SLEEP DEPRIVATION is a factor when the individual obtains insufficient amount of sleep to allow normal function.

IB4: PSYCHOLOGICAL FACTORS - PROCEDURES

IB401 CHECKLIST ERROR is a factor when the individual, either through an act of commission or omission has made a checklist error that results in an unsafe situation.

IB402 INADVERTENT OPERATION - SELF-INDUCED is a factor when the individual unintentionally causes a diversion from standard procedures that results in an unsafe situation.

IB403 NAVIGATIONAL ERROR is a factor when the individual makes a navigational error that results in a unsafe flight situation.

IB404 OPERATED CONTROL/SWITCH IN WRONG SEQUENCE is a factor when the individual makes an obvious procedural error with the controls or the switches by operating them in the wrong sequence resulting in an unsafe flight situation.

IB405 USED WRONG CONTROL/SWITCH is a factor when the individual makes an obvious procedural error with the controls or the switches by using the wrong one resulting in an unsafe flight situation.

IB406 USED WRONG TECHNIQUE is a factor when the individual obviously uses the wrong procedural technique.

IB5: PSYCHOLOGICAL FACTORS - PERCEPTUAL-MOTOR

IB501 FLYING SKILL ABILITY/DEFICIENCY is a factor when the individual lacks the required psychomotor skills to accomplish the task attempted.

IB502 INADEQUATE COORDINATION OR TIMING is a factor when the individual lacks the required coordination or timing skills to perform the task attempted.

IB503 MISINTERPRETED INSTRUMENT READING is a factor when the individual is presented with a correct instrument reading (actual number, e.g., is seen) but its significance is not recognized or is misinterpreted.

IB504 MISREAD INSTRUMENTS is a factor when the individual is presented with a correct instrument reading but misreads the information.

IB505 OVERCONTROL/UNDERCONTROL is a factor when the individual responds inappropriately to perceptual inputs causing an unsafe situation by overcontrol or under-control of the aircraft.

IB506 PHYSICAL TASK OVERSATURATION is a factor when the individual is confronted with a situation in which the number or difficulty of manual tasks to perform in a compressed time period exceeds a their capacity to perform all of them (may be a result of poor crew coordination).

IB507 TIME AND SPACE LIMITATION is a factor when the individual is confronted with a situation in which the time and space limitations exceeds a their capacity to perform the required mission elements.

IB6: PSYCHOLOGICAL FACTORS - JUDGMENT AND DECISION MAKING

IB601 NECESSARY ACTION - DELAYED is a factor when the individual's execution of a selected course of action occurs so long after the decision was made that the selected course of action is no longer appropriate or effective.

IB602 CAUTION/WARNING - IGNORED is a factor when a caution or warning is perceived by the individual but is intentional ignored leading to an unsafe situation.

IB603 IN-FLIGHT ANALYSIS is a factor when the individual does not analyze an in-flight situation to the extent normally expected and this inadequate analysis leads to degraded performance.

IB604 IN-FLIGHT PLANNING is a factor when the individual does not do in-flight planning to the extent necessary to meet mission demands and this inadequate planning leads to degraded performance.

IB605 FAILURE TO USE ACCEPTED PROCEDURE - INTENTIONAL is a factor when the individual deliberately deviates from well understood and accepted procedures and this deviation leads to an unsafe situation. (this indicates a lack of discipline)

IB606 RISK ASSESSMENT is a factor when the individual fails to adequately evaluate potential risks associated with a selected course of action and this failure leads to an unsafe situation.

IB607 NECESSARY ACTION - RUSHED is a factor when the individual takes necessary actions as dictated by the situation, but makes these actions in a hurried or rushed way; when it should have been obvious to the individual more time was available for taking these actions, and the rush in taking these actions leads to an unsafe situation.

IB608 COURSE OF ACTION SELECTED is a factor when the individual through faulty logic and decision making selects the wrong course of action leading to an unsafe situation.

IB609 TASK MISPRIORITIZATION is a factor when the individual does not organize, based on accepted prioritization techniques, the tasks needed to manage the immediate situation as perceived by the individual. This is a dynamic process using a cognitive hierarchy of perceived environmental and individual performance factors by the mishap individual which need to be understood by the investigator before assigning a factor rating.

IB610 FLIGHT DISCIPLINE - VIOLATION is a factor when the individual violates rules, regulations, procedures, or customs that are integral to flight discipline standards.

IB7: PSYCHOLOGICAL FACTORS - EMOTIONAL STATE

IB701 ANGER is a factor when the emotion of anger interferes with rational behavior and / or thought and degrade flying performance.

IB702 APPREHENSION is a factor when individual is in a state of significant anxiety sufficient to interfere with function.

IB703 CAREFREE is a factor when an individual or crew abandons necessary discipline; also a lack of purpose or goal direction.

IB704 CHANGE IN EMOTIONAL STATE is a factor when a individual demonstrates an abrupt change of emotional state, such as from anger to depression, that impairs performance.

IB705 DEPRESSION is a factor when the individual has loss of interest or pleasure in all or most usual activities and pastimes. Individuals who feel depressed will often describe their mood as sad, discouraged, down in the dumps, or simply not caring anymore. Other features include appetite and sleep disturbances, weight change, lack of energy, feelings of worthlessness, difficulty concentrating and in extreme cases, thoughts of death. Aviators will generally not admit to feeling depressed because of being perceived by others as a failure.

IB706 ELATION is a factor when the individual feels pride, high spirits or excitement. An example may be feeling a student pilot experiences when he/she passes their check ride.

IB707 IRRITABLE is a factor when the individual responds to someone or something in the environment in an ill-humored, impatient, excitable manner. Some individuals have this attribute as part of their personality style. They seem to take offense easily to comments about them and are often complaining, discontented people who respond to their environment with sharp tongued, sarcastic remarks and sulky dissatisfaction. Other individuals find themselves feeling irritable over specific instances and respond in a slightly ill-humored way.

IB708 PANIC/CHOKES/FREEZE is a factor when the individual experiences severe anxiety which paralyzes function.

IB709 UNKNOWN is a factor when an emotional state is a likely factor but cannot be specifically documented or identified.

IB8: PSYCHOLOGICAL FACTORS - BEHAVIOR

IB801 COMPLACENCY is a factor when the individual's state of reduced conscious attention due to an attitude of overconfidence or undermotivation leads to an unsafe situation.

IB802 MOTIVATION TO SUCCEED - EXCESSIVE is a factor when the individual is preoccupied with success to the exclusion of other mission factors leading to an unsafe situation.

IB803 GAMESMANSHIP OR CAREERISM is a factor when the individual uses a form of manipulation of "the system" or its rules for the sake of convenience or personal interest, often to the detriment of the intent of rules or guidance (Also called careerism.)

IB804 GET-HOME-ITIS/GET-THERE-ITIS is a factor when an individual or crew is in a hurry to complete a mission, thereby short cutting necessary procedures or exercising poor judgment, leading to an unsafe situation.

IB805 CONFIDENCE is a factor when the individual exhibits uncertainty regarding their capability which leads to an unsafe situation. [An attitude in which a person assumes that he or she cannot perform a task, even though he or she has the demonstrated capabilities necessary.]

IB806 DISCIPLINE is a factor when the normal and necessary procedures of flight, Air Force Instruction, regulations, and rules of engagement (in the military environment) are abandoned; may also refer to an atmosphere of poor discipline in a unit.

IB807 MOTIVATION - INADEQUATE is a factor when the individual or unit motivation to accomplish a task or mission is weak or indecisive.

IB808 MOTIVATION - MISPLACED is a factor when an individual or unit replaces the primary goal of a mission with a personal, not necessarily related, goal.

IB809 OVERAGGRESSIVE is a factor when an individual or crew are excessive in the manner in which they conduct a mission; i.e., flying too close to the ground, banking beyond aircraft tolerance.

IB810 OVERCOMMITMENT is a factor when an individual has a response set in which they commit to a task for which they are knowingly ill-prepared and which presses them and their aircraft beyond reasonable limits ("taking a chance" or "pressing"). (See motivation.)

IB811 OVERCONFIDENCE is a factor when the individual exhibits a tendency to over-value personal capability thus compromising performance. [An attitude in which a person assumes that he or she can perform a task even though this may not be true because he or she has not successfully performed it in the past, has performed it in the past but under different circumstances, or because it is unrealistic to attempt it at all.]

IB812 PREOCCUPATION is a factor when the individual has a tendency to fix on a thought or action limiting total awareness.

IB813 PRESSING is a factor when the individual has a response set in which they commit to a task for which they are knowingly ill-prepared and which presses them and their aircraft beyond reasonable limits ("taking a chance" or "pressing"). (See motivation.)

IB814 RESPONSE SET is a factor when the individual has a cognitive or mental framework of expectations which predispose them to a certain course of action regardless of the environmental cues.

IB9: PSYCHOLOGICAL FACTORS - PERSONALITY STYLE

IB901 AUTHORITARIAN is a factor when the individual expects unquestioning submission to demands. Orders others around with little concern for feelings or abilities. An example of this type of individual might be an aircraft commander with marginal flying skills who tries to intimidate his crews with this type of behavior so they do not question his decisions in the cockpit.

IB902 CONSERVATIVE is a factor when the individual demonstrates conservative characteristics beyond the point normally associated with the premise that the "most conservative action is the safest" and this conservative approach leads to an unsafe situation.

IB903 EXPLOSIVE is a factor when the individual's personality style under stress erupts into verbal hostility. Can degenerate into inappropriate acting out behavior with an angry tirade aimed at others around them. Takes a small incident to set off and anger is often out of proportion to the incident.

IB904 IMPULSIVE is a factor when the individual demonstrates a characteristic style of behavior, or problem solving that involves little or incomplete planning, and lacks discipline necessary for safe mission accomplishment.

IB905 INVULNERABLE is a factor when the individual demonstrates a "bullet proof" attitude that leads the individual to ignore realistic threats or risks.

IB906 LONER is a factor when the individual demonstrates a characteristic manner of relating to others, involving little socialization; implies poor social relationships and a potential for degraded communication.

IB907 MACHO is a factor when the individual overly identifies with the masculine role. Exaggeration of one's aggressiveness and prowess. Behavior or attitude is manifested to overcompensate for underlying feelings of inferiority or inadequacy.

IB908 NARCISSISTIC is a factor when the individual has a grandiose sense of self-importance or uniqueness. Need for attention. Exaggerated sense of self-importance and self-centeredness. Overvaluation of one's own attributes, abilities or achievements.

IB909 PASSIVE AGGRESSIVE is a factor when the individual exhibits indirect expression of hostility through resistance for demands of adequate performance in both occupational and social functioning. Expressed indirectly rather than directly with such maneuvers as acting as though they don't understand the directions given or questions asked; procrastination, forgetfulness, intentional inefficiency, etc.

IB910 SUBMISSIVE is a factor when the individual's personality style yields to power, control or authority of another individual or group. An example of this may be a crew-member who refuses to confront a pilot who flew recklessly and jeopardizes his crew for fear of reprisals from the pilot, other crew or squadron members.

IC1: PSYCHOSOCIAL FACTORS - PEER INFLUENCES

IC101 OFFICERSHIP is a factor when the way the individual perceives the officership of their peers effects their performance. [Officership - How one conducts self as officer, i.e. military bearing, professionalism. A term applied to a vocation which implies autonomy, group identity, altruism, extraordinary skill, and exercise of judgment.]

IC102 PEER OR CREW RULE VIOLATIONS is a factor when the group disregard of expectations or written procedures leads to an unsafe situation.

IC103 PEER PERCEPTION/MORALE is a factor when the group view of individual or unit expectations is negative. [A mindset consisting of a set of subjective assessments of well being relative to factors an individual perceives as important (which may be characterized by confidence and optimism or by bitterness and pessimism). Morale suffers when unnecessarily high or vague expectations are created because subsequent actual experience cannot measure up to them.]

IC104 PEER PRESSURE - EXPRESSED is a factor when the group verbal expression of expectations lead to an unsafe situation. [A motivating factor stemming from a person's perceived need to meet peer expectations. Peers may or may not express those expectations.]

IC105 REPUTATION is a factor when the perceived reputation of the individual held by peers or public leads to an unsafe situation.

IC2: PSYCHOSOCIAL FACTORS - PERSONAL AND COMMUNITY

IC201 BACKGROUND - EDUCATION is a factor when the individual's education leads to an unsafe situation. [School grades completed; degrees started / completed; PME; other education.]

IC202 BACKGROUND - PERSONAL/FAMILY is a factor when some aspect(s) of the individual's family history or relationships inappropriately effects the individual's motivation and / or behavior.

IC203 CAREER/JOB PROGRESSION is a factor when the individual's evaluation of occupational advancement or development leads to an unsafe situation.

IC204 CAREER/JOB SATISFACTION is a factor when the individual's evaluation of occupational contentment leads to an unsafe situation.

IC205 COMMUNITY ACTIVITY PARTICIPATION is a factor when the individual's activities require time and energy investment beyond duty commitment and leads to an unsafe situation.

IC206 FAMILY OR FRIEND ILLNESS/DEATH is a factor when the individual experiences an illness or death of a close family member or friend within the last year and this degrades crew performance.

IC207 FAMILY PROBLEMS is a factor when the individual experiences interpersonal relationship difficulties and conflict resulting in degraded crew performance.

IC208 FINANCIAL PROBLEMS is a factor when the individual has financial problems that degrade crew performance. [Excessive money issues; i.e. living beyond means, unexpected life situation.]

IC209 INTERPERSONAL RELATIONSHIPS is a factor when the individual's personal and social relationships result in degraded crew performance.

IC210 LEGAL PROBLEMS is a factor when the individual's legal problems lead to degraded crew performance. [Significant legal issues; i.e. adoption, court case, divorce action.]

IC211 MARITAL PROBLEMS is a factor when the individual has marital problems that lead to degraded crew performance. [Interpersonal relationship disagreements causing dysfunction.]

IC212 RECENT ENGAGEMENT/MARRIAGE is a factor when the individual's recent engagement / marriage resulted in degraded crew performance.

IC213 RECENT HOLIDAY/VACATION is a factor when the individual's recent vacation resulted in degraded crew performance.

IC214 RECENT OR PLANNED CHANGE IN CAREER/JOB is a factor when a change of occupational circumstance, usually within last year, of the individual leads to degraded crew performance.

IC215 RECENT PROMOTION CONSIDERATION is a factor when the individual's recent promotion consideration resulted in degraded crew performance. [Time person considered for promotion until results of board announced.]

IC216 RECENT SEPARATION/DIVORCE is a factor when the individual's recent separation/divorce results in decreased crew performance. [Tumultuous interpersonal relationship resulting in separation or ending of relationship.]

IC3: PSYCHOSOCIAL FACTORS - COMMUNICATION

IC301 BLOCKED TRANSMISSION is a factor when transmitted information is electronically or physically blocked from reaching the individual and the lack of this information degrades aircrew performance.

IC302 BODY LANGUAGE/GESTURES is a factor when significant non-verbal mannerisms of someone else are perceived by the individual as information communicated to him that influences his actions and degrades crew performance.

IC303 COMMUNICATION HABITS is a factor when the individual's standard technique of communication is not appropriate to the current situation and creates an unsafe environment.

IC304 DISRUPTED COMMUNICATIONS is a factor when the individual receives partial communications which do not relay the information as intended and lead to degraded crew performance.

IC305 EXTERNAL COMMUNICATION is a factor when communication received by the individual, from a source other than his aircraft, is not appropriate to the situation and causes degraded crew performance.

IC306 INADEQUATE COMMUNICATION EQUIPMENT is a factor when the equipment used for communication is inadequate to support this mission.

IC307 INTRACOCKPIT COMMUNICATION is a factor when communications between this aircraft's crew causes this individual's performance to be degraded.

IC308 MISINTERPRETED COMMUNICATIONS is a factor when the individual misinterprets correctly communicated information which leads to degraded crew performance.

IC309 RADIO DISCIPLINE is a factor when the individual's communications techniques are not consistent with standard radio discipline and lead to degraded crew performance.

IC310 VOICE TONE/INFLECTION is a factor when the individual's verbal tone or inflection imparts a different meaning to the information communicated to another person and leads to degraded crew performance.